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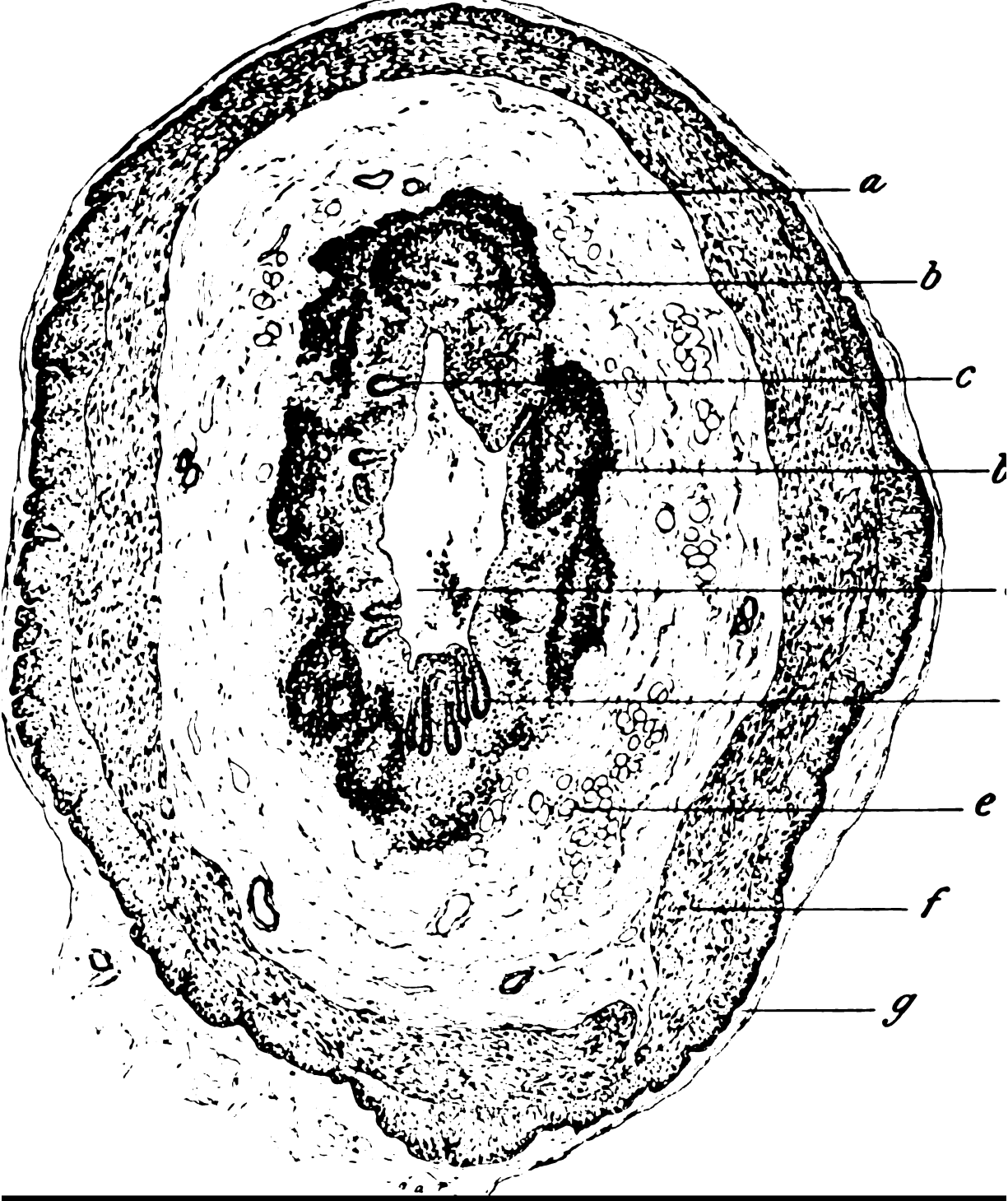

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UNIVERSITY
MEDICAL MAGAZINE

OCTOBER, 1894.

A CASE OF MULTIPLE BRAIN LESIONS.[1]

By H. C. Wood, M.D., LL.D.

Gentlemen: I present before you this morning a very curious case, whose diagnosis will lead us into the discussion of cerebral localization, a subject which, unless it be in its minutest details, is not after all half so difficult as it is interesting.

The following is the history of the case:

This young woman, who is about 23 years old, came to us with the statement that during the latter part of June, 1892, she had paroxysms of sleepy feeling, with pricking of the flesh as if by pins in the whole right side. These feelings would last about ten minutes. In November of the same year they would last about one hour, and would occur quite often. In June, 1893, she was taken in her right arm with a "whirling sensation," which extended down to her right lower limb. In attempting to walk she fell to the floor and became unconscious for about half an hour: one month later she had another attack similar to this. In the early part of November, 1893, she had another similar attack, but not so violent. These spells came about the time of her monthly periods. In addition, the whole right side of the abdomen had a feeling of tenderness, and she could not bear the weight of her clothing upon it. In the latter part of August, 1892, she began to notice some failure of vision, which increased until there is complete blindness of the right eye and impaired sight in the left eye. The first point we wish to make out in the investigation of this case, so far as the relation of the eyes is concerned to the brain-disease, is as to the *character* of the loss of sight; whether, in other words, it is a case of simple amblyopia, simple disorder of vision, or of hemianopsia, in

[1] Clinic held at the University of Pennsylvania Hospital, January 17, 1894.

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which there is blindness, not of the whole eye, but of half of the eye. This can be determined by means of a simple test which I use continually in my office; the test, however, is not sufficiently accurate for scientific investigation.

(The Professor, sitting in front of the patient at a distance of about two and a half feet, directed the sight of left eye of the patient at his (the Professor's) nose, and then brought a pencil rapidly from above, below, and the side, into the field of vision.)

You see what I am doing. I am comparing this patient's field of vision with my own, using my own as a standard. In her left eye there is no hemianopsia; if there were, she would not see the pencil equally upon both sides of the field. In her right eye vision is altogether gone.

Upon inquiry I find she has had very bad headaches accompanied with giddiness. Let us now take up the investigation of her special senses. Her hearing can be tested with a watch, as you see me do. I find no distinct disorder of her hearing; in fact, there is no disorder of any of her special senses other than that of vision. In regard to her motor conditions, you will notice that when she walks she does so with short steps, with the feet not widely straddled. She walks backward fairly well, but upon putting the heels closely together, you notice she can hardly stand up, and, strange to say, she stands in this position better with her eyes shut than when they are open. The nurse informs me that this woman's gait was the same while she was in the ward. We learn from the patient that there is a little tendency to staggering from one side to the other.

The next step in our investigation is that of reflexes, especially of the patella, and we find exaggeration of both reflexes. Further, we find no loss of sensation. What did this case at the outset suggest to your minds? Hysteria. What other point was not brought out in the history which is essential in our diagnosis? The steadiness of the symptoms.

Hysterical symptoms usually shift continually. If you get a history of a patient being blind to-day and seeing to-morrow, the chances are 99 out of 100 that you have a case of hysterical blindness to deal with. This patient states, however, that there have been no alternate periods of blindness and vision; she has had no laughing and crying spells; the numbness in her hand and arm have been steady, not going and coming, and she has persistent motor weakness in the right arm and leg. You notice that it is the right eye that is blind and the right arm and right leg partially paralyzed.

We sent her to the eye dispensary, and got a report of albuminuric retinitis. We had the urine examined repeatedly, however, and it was

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always found normal, and when you take a young girl like this and find her urine normal to tests, you can practically lay aside kidney-disease, especially if there be no pronounced general symptoms of kidney-disease.

We then sent her to Professor Norris himself, telling him that we found no signs of kidney-disease. He said that the condition of the eyes resembled very closely in appearance albuminuric retinitis, but was really different, and the outcome of brain pressure.

Here we have conditions of the retina and nerve, due to organic brain disorder, so closely resembling albuminuric retinitis that experts of the first class are deceived, and no ordinary neurologist, let alone general medical practitioner, would be able to make a diagnosis between the two conditions. To-day that condition has passed away, the edematous swelling of the nerve point has given way to contraction, with white nerves and atrophy, so common a proof of the existence of a chronic brain lesion. This girl must, therefore, have some form of chronic brain-disease, and the difficult point to be decided is where the lesion is located.

When we come to study the brain for the purposes of cerebral localization, we find that it divides itself naturally into three parts. The first of these, the anterior, or frontal, lying in front of the ascending convolution, the portion of the brain whose function to-day is unknown. It is probably connected in some way with intellectual action; it is, pathologically, the *inert* portion of the brain, and a tumor may exist in this part without the production of a single symptom. Indeed, I have seen a clot, the size of a pigeon's egg, cause no symptom in a case under hospital supervision until secondary softening brought out evidences of failing brain power. In the most favorable case all that we can do is to suspect the existence of a tumor in this region. The second part of the brain is that of the motor tract, which lies on the side of the fissure of Rolando following the ascending convolutions deep down into the region of the fissures of Sylvius and island of Reil. Posteriorly to this is the sensory region, embracing the whole posterior brain, with the sense of hearing having its function localized in temporal gyri or convolution, and the function of vision localized especially in the extreme back end of the occipital region; both of these functions are probably capable of being disturbed by lesions in the central region, provided these lesions are so situated as to cut fibres which connect the sense centres with the outer world.

If you remember these facts, you have the map before you which will enable you to understand any brain subject. First, anteriorly, is the frontal region, then the fissure of Rolando with the ascending frontal and parietal convolutions; then posteriorly we have the sense

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region, with sight located in the cuneus, and hearing in the superior temporosphenoidal convolution. We find the region of speech memory in the island of Reil and fissure of Sylvius.

It is plain that in the present case the only special sense brain region which can be affected is that connected with vision, since all other special senses are intact. What portion, then, of the visual cerebral tract is implicated? Plainly not the cuneus, nor yet the corpora quadrigemina, nor yet the optic-nerve fibres between the corpora quadrigemina and the optic chiasm, nor yet the optic chiasm, because any tumor or other lesion situated posteriorly to the optic chiasm must produce a hemianopsia for anatomical reasons; whilst a lesion of the optic chiasm itself would almost of necessity produce some hemianoptic symptoms. It is plain that the lesion which produces this loss of sight must be situated in, under or near the base of the frontal lobe, in such a position as to directly affect the nerves of the eye. It is possible that the loss of sight is due to an optic neuritis, the inflammation of the nerve having gone on to such a degree that it is no longer functionally capable. Remember, however, that one eye is much more affected than the other, and that this one eye was completely paralyzed as to its functions months before the other was discovered to be affected at all. This is not a history of a neuritis due simply to a general increase in the brain pressure. In balancing the probabilities we are forced to the conclusion that the greater probability lies on the side of the theory that the loss of sight in the right is due to a tumor, to an exudation, or to some lesion directly affecting by contact or otherwise the optic nerve in front of the chiasm. It is possible, or at least conceivable, that a tumor situated under the frontal lobe might produce this disorder of vision and affect the motor area in the middle brain region by proximity, by pressure, or by disturbance of circulation. Unfortunately for this theory, the right eye and the right side of the body are each paralyzed, whereas, if the situation was as has just been suggested, the right hemisphere being the site of the lesion, the paralysis should be on the left side of the body.

In all cases of organic brain-disease presumably of the nature of tumor, in which the symptoms have existed for months, beware of being misled by the development of secondary brain lesions which in their turn may give rise to symptoms so prominent as entirely to overshadow the manifestations of the original disease. I cannot, however, conceive of any lesion of the brain directly secondary to the one which produces the ocular disturbance here present that should cause the paralytic symptoms and the disturbance of co-ordination which exist. Let us, therefore, examine a little more carefully these motor disturbances.

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Testing her knee-jerks you see at once that the reflexes are grossly exaggerated. Asking her to walk, you note that her gait is peculiar, resembling somewhat but differing essentially from that of true locomotor ataxia. To my sight she seems to have an imperfectly developed titubation. Titubation, you remember, is the name applied to the peculiar gait produced by disease of the cerebellum. It differs from the true ataxic gait especially in the fact that the patient does not stand with the feet widely apart, as in posterior sclerosis, and does not throw the feet out violently, almost choreically, as occurs in the latter disorder. In titubation the patient takes short steps and has a lateral uncertainty of movement which is the basis of staggering. In some cases of cerebellar disease there is a tendency to run backward; no such tendency exists in the girl before you, but notice her short steps, and notice her excess of lateral movement amounting at times to a true staggering gait. This gait is not ataxic. It is not absolutely typical titubation, but it approaches the latter much more than the former gait.

Another symptom, as you well know, commonly seen in cerebellar tumor is violent and apparently causeless vomiting. Again, here we find indication of the cerebellar symptom without its full development. This girl has from time to time vomited without gastric disease and without apparent cause, but the vomiting has not been very violent nor very often repeated. One strange symptom which is shown in our patient, and which is commonly thought of as of spinal origin is the gross exaggeration of the knee-jerks. In the vast majority of cases of nervous diseases any disturbance of the knee-jerks is spinal in its origin, but we may have in the case of cerebellar tumor loss of reflexes, or an increase of reflexes, or the reflexes may be normal. Moreover, in typical cases we may have a shifting condition of the reflexes which I believe to be characteristic of cerebellar disease, or, at least, of some disease in the immediate neighborhood of the cerebellum. In such a case, starting from the primary normal reflex, we find the knee-jerks diminishing until they disappear, and then in the lapse of weeks or months beginning to return until they become normal, and then continuing in their upward tendency until finally they are grossly exaggerated.

The explanation of this remarkable series of phenomena seems to me to be possible through our knowledge of the inhibitory functions of the so-called Setschenow centres, which are situated somewhere in the base of the brain. These centres, as you well know, have for their function inhibition of the motor cells of the spinal cord. When an impulse reaches these spinal motor cells from the periphery, it is due to Setschenow's centre with its subordinate, inhibitory centres, that the response to this impulse is confined to the cells which it first reaches,

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whilst these cells themselves are prevented from responding with excessive activity and feeling by the checking power of the inhibitory centres. If a tumor commences to develop close to but not in immediate contact with Setschenow's centre, this centre before it is paralyzed by pressure feels the irritation of the growing mass, and by this irritation is thrown into functional exaltation. There is, therefore, a condition of excessive spinal inhibition with consequent functional depression of the motor spinal cells, and lessening or complete loss of the reflex activity. As the tumor increases in size irritation of the near-by inhibitory centres more and more merges itself into paralysis from pressure and increasing inflammation, and as this process goes on in the Setschenow centre functional exaltation gradually changes into functional depression. There is a time when the two antagonistic conditions, failing irritation and growing paralysis, completely balance, and the spinal cord is left to its normal self. At such time the reflexes come back practically to the norm. As the change in the Setschenow centre deepens, however, paralysis gains the upper hand of functional excitement, until at last the inhibitory centre is completely paralyzed and the whole restraining force removed from the motor cells of the spinal cord. At such times gross exaggeration of the knee-jerks must be present.

In the case before us I do not believe that the exaggeration of the reflexes is of spinal origin. In the presence of a form of titubation, of vomiting, of headache, and of other evidences of general disturbance of the cerebral mass, there is demonstration of morbid growth or other progressive organic lesion within or in the neighborhood of the cerebellum. It would seem, therefore, most probable that the girl before us has multiple lesions within her cerebrum, one anterior and one posterior. It may well be, also, that she has a third lesion affecting the motor tract of the middle portion of the hemisphere, situated in the left hemisphere and causing the motor palsy.

I may say here I have usually very little faith in a diagnosis of cerebral disease which necessitates or supposes the presence of two lesions; sometimes, however, multiple brain lesions do occur. What diseases of the brain commonly gives rise to multiple lesions? Tuberculosis and syphilis. Therefore, there is at once the suggestion that you have to deal in this case with tuberculosis or with syphilis. There is nothing in this girl's past history which tells us of syphilis; she comes from a family which seems above suspicion. I do not for a moment believe that she is impure and has an acquired syphilis; there is, therefore, every moral reason to believe that syphilis does not exist. At the same time, when it comes to practical medicine, never take it for granted

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that syphilis cannot exist in any one. I have seen it in the pew and pulpit, in the dens of infamy and in the high places of the earth.

It often crops out where least expected. If in any individual like this young woman the symptoms point strongly towards a specific disease, keep your own counsel, do not even make inquiries, but act; try the therapeutic test. In accordance with this, without stirring up the past, a few days ago I put this girl on mercurials. She insists that she feels better and is better. Her gait does seems to be a little improved. Moreover, she has been for several days now without an attack. Nevertheless, it is hard to come to a positive conclusion, because the history of her past shows that the symptoms vary in their intensity from time to time, and because her epileptoid attacks have been so irregular, now in groups, now coming on at long intervals. I shall, however, continue the trial, and report to you the result.

[This case was mercurialized and shown to the University class from time to time for several months. The symptoms began to abate before ptyalism appeared, and under the continuous use of mercurials and afterwards of the iodide of potassium, the patient lost her headaches, the reflexes became normal, the paralytic arm regained its power, and the patient was finally discharged from the hospital, having had no epileptoid attacks for several months and seemingly entirely well. As stated by the lecturer, when she was finally shown to the class, the result seemed in every way to justify the original diagnosis that the lesions were the outcome of a tardily-developed hereditary syphilis.]

PHENOLIC SUBSTANCES IN TUBERCULOSIS (NASCENT PHENIC ACID, CARBOLIC ACID, CREOSOTE, GUAIACOL, AND BENZOYL OF GUAIACOL).[1]

By Roland G. Curtin, M.D.,

Philadelphia.

My principal object in reading this paper at this meeting is to elicit a general and full discussion on the use of the phenolic substances in the treatment of pulmonary tuberculosis.

Two papers have been published by the association, one by Dr. Glasgow on Creosote in Pulmonary Diseases in 1891, and one by Dr. Jacoby on Guaiacol in the Treatment of Pulmonary Tuberculosis in

[1] Read before the American Climatological Association at Washington, May 30, 1894.

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1892. We have never had a full discussion of the subject at a large meeting, and I am sure the opinion of our members will be received by the outside medical world with gratitude.

DeClat's Syrup of Nascent Phenic Acid.—I have been using DeClat's syrup of nascent phenic acid more or less for fifteen years. The directions for its proper use include the administration of the syrup by the mouth, a gargle for the throat, and a preparation for hypodermic use.

After repeated attempts to use the remedy hypodermically I abandoned it altogether. The injections were followed by great suffering, and it was a rarity to find a patient that would allow the subcutaneous treatment to be used for more than a few days. One patient said that death would be preferable to the treatment; another said that he was more content to be comfortable than to be improved by the painful treatment. The pain was severe at the point of puncture, and often radiated along the course of the nerves towards the body. It was not uncommon to have a painful numbness in the whole limb lasting for hours.

The most of my patients were treated by the syrup administered by the mouth. To be brief, I will simply state in a general way that the results in the improved cases were shown by the following evidences: an increase in weight, diminished cough and expectoration, less dyspnea, and more strength and appetite. One woman had been incapacitated for work for years, owing to weakness, a result of a chronic lung disease she had had for six years. She had a cavity at the left apex. She had come into the hospital to die. In two weeks after the administration of the syrup she had gained six pounds, and had improved in every respect. At the end of two months she left the hospital, and took a position as a domestic, and was there a month later, still improving. The improvement in this case was the most marked of any I had under treatment. It illustrates the kind of cases which are most benefited by the internal use of the phenic acid,—viz., chronic phthisis with slow emaciation and low temperature and poor assimilation of food.

Carbolic Acid.—I have tried the ordinary carbolic acid in a number of cases, but it did not seem to do as well as the nascent form (in DeClat's syrup).

Creosote.—Another article of the phenolic class that has long been used by the profession in the treatment of consumption is creosote, but not to the extent it has been since the introduction of Beechwood creosote. This was found to contain a larger amount of guaiacol, and this discovery led to the extensive use of guaiacol in tuberculosis; then followed the experiments with the carbonate, iodate, benzoate,

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and salicylate. These last-mentioned preparations have been used both hypodermically and by the stomach, but the results have not been universally satisfactory.

Creosote has been administered in large doses, one physician having given as high as 150 drops a day for months without any ill-effects, but, on the contrary, followed by marked good results, results not obtained by smaller dosage. I have given fifty drops a day continuously for over a month with improvement which decreased upon diminishing the dose, and in the same ward and with the same creosote other patients were injured by doses of five drops, as shown by unpleasant eructations and disordered digestion. If the stomach is disturbed by the creosote no good results need be expected from its use. Occasionally, though rarely, the use of this remedy is followed by renal irritation, and sometimes by hematuria. I have not observed these symptoms in hospital patients, but have now and then observed them in private practice. It has occurred to me that the ill-effects might be due to an impure, adulterated, or substituted article. (A druggist once said to me, "It don't make any difference which you put in a mixture, carbolic acid or creosote. They are the same.")

The following are the conclusions arrived at by Dr. J. T. Whittaker:[1]

(1) When pure creosote is harmless.

(2) It has no direct action upon the tubercle bacillus.

(3) Tuberculosis pulmonum is chiefly a secondary affection by streptococcus.

(4) Creosote has no direct action on this streptococcus, hence none whatever on hectic fever.

Guaiacol.—After long and repeated observations, I am satisfied that following the administration of guaiacol in tuberculosis, or catarrhal disease of the lungs with high temperature, no material benefit is to be expected. The class of cases that seem to be most improved by the use of this medicine is the one in which we have slow progress, slight rise of temperature, slow digestion with fermentation, and poor nutrition. The improvement noticed in these cases may be summed up as follows: improved digestion and nutrition, and diminished breaking down of the pulmonary tissue, and consequently less expectoration. Guaiacol, creosote, carbolic acid, and phenic acid have been used successfully in the past in the treatment of simple fermentative dyspepsia.

I have observed that guaiacol obtained from different sources is followed by varying results. I am also convinced that some pharmacists substitute creosote where guaiacol has been called for. I have been using guaiacol in the encapsulated and the compressed pill form

[1] Therapeutic Gazette, July, 1893, p. 438.

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for the last three years. The benefits of this method of administration are the absence of taste, and it is less irritating to the stomach, and is less liable to be followed by unpleasant eructations.

From my experience I should say that guaiacol is beneficial in chronic ulceration of the lungs, no matter whether associated with the tubercle bacillus or not. From this fact I am satisfied that *the guaiacol has no specific effect upon the tubercle bacillus.* I have had ample opportunity to observe in the cases of influenzal phthisis the action of this drug, and I am satisfied that the improvement following its use in these cases was about the same as the tubercular cases. The best results were obtained in patients where the destructive process was slow and the symptoms were mild, very much the same as were reported under the head of creosote.

When we take into consideration the chemical composition of these articles they are found to be much the same, and when used in the treatment of tuberculosis they all seem to act much the same way. In my hands guaiacol has appeared to be the most reliable.

Conclusions.—Guaiacol is not irritating to the stomach, nor is it so liable to produce irritation of the kidneys or hematuria as creosote.

It has no specific action on the tubercle bacillus, but seems to act beneficially on the digestive tract, improving nutrition, and thereby assisting repair.

Among the advantages of guaiacol over creosote are,—

(1) It is more easily taken.

(2) The process of manufacture insures purity.

(3) You know the exact quantity of the medicinal substance you are administering.

Benzoyl of Guaiacol.—Professor Winkle, a German physician, has written an article and given statistics highly extolling the use of benzoyl of guaiacol. A number of cases of advanced phthisis were treated by him, and for the first two or three months they all increased in weight; some continued to improve after that time, while others remained stationary or lost. After reading this paper I used the article quite extensively. Theoretically this combination should be more successful than simple guaiacol, but I must confess that I found no advantage over the simple guaiacol. I found that in almost all cases where the patient eructated the taste of guaiacol the same disagreeable taste followed the use of benzoyl of guaiacol, which upon reaching the stomach changes into the substances of which it is composed. It is certainly much pleasanter in taste, and is readily made into a compressed pill. The high price is an objection to this drug, as in full dosage the patient would be at considerable expense. My results were not as good as those reported by Dr. Winkle, and the improvement was usually not as marked as after the use of simple guaiacol.

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PROPHYLAXIS IN THE TREATMENT OF TUBERCULOSIS.[1]

By Lawrence F. Flick, M.D.,
Philadelphia, Pa.

With the demonstration of the parasitic nature of tuberculosis began a new era in its treatment. In the past the medical profession has had no resources in its struggle with this disease except such as it could draw from empiricism, but in the future its combat will at least be founded upon a rational basis. All that has been found useful in the past can now be used more intelligently and more effectively because we can give a reason for its use, and can discriminate in its application; and the new light has already enabled us to discover pathways which promise to lead us to the El dorado in which will be found the precious substances that will cure.

From the organic theory of tuberculosis we can learn many valuable lessons in treatment. The organic theory as now elucidated can be briefly summarized as follows:

(1) Tuberculosis is a parasitic disease due to the implantation and development of a vegetable organism in the tissues of the body.

(2) For the successful implantation and development of this organism the tissues of the body must constitute a proper soil, which may either mean that they contain a certain something conducive to the development of the organism, or they lack a certain something which would interfere with the development of the organism.

(3) The symptoms which we recognize as constituting the disease we call tuberculosis are partially due to the irritating presence of the parasite, partially due to the destruction of tissues which takes place during the effort of nature to cure, and partially to the absorption of poisonous products of the organism.

(4) When death takes place from tuberculosis it is usually due to the ptomaines produced by the organisms causing the disease, but may be due to destruction of tissue, or to the inflammation set up by the parasite.

(5) The severity and rapidity of progress of a case of tuberculosis is in proportion to the fertility of the soil and the number of organisms implanted.

(6) The soil for tuberculosis is not exhausted, but, on the contrary, is enriched by the growth and development of the organism producing the disease, and is likewise enriched by the growth and development of organisms producing other diseases.

[1] Read before the Pennsylvania State Medical Society, Philadelphia, June, 1894.

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(7) Fertile soil for the development of tuberculosis can be transmitted from parent to offspring, and can be produced by mode of living and by occupation.

(8) Tuberculosis cannot exist without the organism which produces the disease, and therefore no new case can arise without having an old one to spring from.

A most valuable lesson taught by the organic theory of tuberculosis, and one hitherto unrecognized, is prophylaxis in the treatment of the disease. Tuberculosis is strictly a parasitic disease, and as such is always a local disease. It is local, however, only in its cause, for the absorption of the products of the tubercle bacillus sets up constitutional symptoms, and death usually results from the absorption of those products. It might therefore be termed a constitutional disease with a local cause. Nature makes a strong effort to get rid of all parasites, and in tuberculosis this effort manifests itself in the formation, breaking down, and casting off of the tubercular nodule. Unfortunately, this very process may be the means of extending the disease. When a tubercular nodule breaks down the escaping organisms are liable to find their way back into the circulation, and to form new deposits. Re-entrance into the circulation may take place at the seat of ulceration where the broken-down tissue seeks exit, through a denuded surface in the mucous membrane of the respiratory tract, through the peribronchial glands, and through the stomach.

Were it not for auto-infection or re-entrance of the organisms into the system all cases of tuberculosis would get well. It is very rare that the first invasion of the organism is powerful enough to produce death. In those cases which are called acute tuberculosis, and in which death ensues in a few weeks, it is quite probable that the large number of organisms which are capable of producing such a result are not taken into the system at one time, but have been grown in the system in some gland, and have suddenly been set afloat in the circulation by the breaking down of that gland. Most cases of tuberculosis are simply a prolonged series of invasions of the organism in which each new invasion is the outcome of a former abortive effort at cure. This accounts for the long duration of tuberculosis, and also for the variation in its duration in different persons. Where the resisting power of the individual is good, the various invasions are apt to be mild and the breaking-down process slow, making the intervals between the invasions longer. The sanitary environments, and the habits of life also, are pregnant factors in determining re-infection, and consequently the duration of the disease. Hence we have the duration of tuberculosis ranging from a few months to many years. And yet the disease is the same in all persons, differing only

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in the rapidity of the breaking-down process, and in the number and size of the invasions.

A clear knowledge of the nature of tuberculosis and a full appreciation of the influences which bear upon its development are of primary importance in its treatment. Auto-inoculation, whilst it cannot be absolutely prevented, can be, to a great extent, controlled, and the rapidity of the breaking-down process can in many cases be materially checked. Along this line lies all scientific treatment of tuberculosis so far known, and along this line all future effort in search of remedies or modes of treatment must be made. When we can absolutely stop all auto-inoculation we can cure the disease, and until we can do that deliberate and unfailing cure is impossible. In those cases in which recovery takes place this is the process by which it is brought about, and as far as we are now able to see it is the only process by which it is possible.

Auto-inoculation can be largely controlled in two ways, by building up the system of the patient so as to enable it to resist new deposits, and by preventing the readmission of the organisms into the system. For the building up of the system every possible resource must be drawn on, and the food-supply, the digestion, the assimilation, and the elimination all carefully studied and corrected, where faulty, so that the largest possible amount of nutrition may be obtained with the smallest possible consumption of force and energy. Increase in weight and strength and the restoration of the normal functions of the different organs of the body is the best evidence we can have that this is being accomplished. Improvident expenditure of force must be guarded against. Violent or prolonged exercise, depressing mental influence,—anything, indeed, that makes an unusual demand upon the muscle or nerve resources of the body should be scrupulously avoided. Forced nutrition should be practised as far as it is compatible with the maintenance of a healthy condition of the stomach. Ample sleep should be taken, and the nervous system always kept in a good vigorous condition.

The re-entrance of the tubercle bacillus into the system can be prevented to a large extent by the sterilization of all broken-down tissue as soon as it is given off. Of course re-entrance at the seat of exit, if there are broken blood-vessels at the place of ulceration, cannot be protected against; but fortunately the channel through which a broken-down nodule empties itself is frequently a non-absorbing surface. Re-entrance through denuded mucous membrane of the trachea and through peribronchial glands is also difficult to guard against. But when the broken-down tissue has once made its exit from the body, it is comparatively easy to prevent it from again infecting the patient. This can be accomplished by immediately sterilizing it whilst still in a moist condi-

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tion. All sputa of tuberculous subjects should be ejected into a sputum cup, containing a liquid and, if possible, a germicide, and where this is not practicable into a paper handkerchief. Handkerchiefs made of other material should not be used, because the sputum dries too readily in them and the patient is very apt to rub it up or scatter it in pulling his handkerchief apart. When handkerchiefs are used they should not be allowed to become saturated, and should, after using, be burned. Under no circumstances should tuberculous matter ever be allowed to remain and dry on bedclothing or upon furniture, carpets, etc. In short, all tuberculous matter given off by a patient should be devitalized at the earliest possible moment after it has made its exit from the body.

It is quite likely that reinfection sometimes takes place through the stomach. Tubercular matter is frequently swallowed by patients voluntarily and still more frequently by accident. Broken-down tubercular matter is apt to adhere to the pharynx and to be swallowed with food in eating. The living organisms in such matter may meet their death in the stomach through the agency of the gastric juice, but may also run the gauntlet of the stomach if the secretion of gastric juice is deficient or if protected by undigested food, and be carried into the circulation with the chyle, finding lodgement in whatever part of the body best fitted to receive them. It is therefore of the greatest importance that patients be instructed not to swallow sputa. Where the expectoration is profuse, it is well to have the patient gargle the throat with an astringent before eating. Sometimes the hands and mouth are smeared with sputa, and for this reason the precaution of washing these ought to be taken before eating.

Where a patient is living in a room in which preventive measures have not been practised, such room ought to be carefully disinfected. This disinfection does not consist of burning sulphur or whitewashing, but in completely renovating the room. The walls should be scraped and then washed with a five-per-cent. solution of carbolic acid. If the walls have been painted they should be rubbed down with bread and then washed with carbolic-acid solution. The floor should be scrubbed with a carbolic-acid solution, and every particle of furniture, carpet, bedding, etc., in the room should be either subjected to a temperature above 158° F., or disinfected with a five-per-cent. solution of carbolic acid or a one-tenth-per-cent. solution of corrosive sublimate, to which must be added some tartaric acid, citric acid, hydrochloric acid, or muriate of ammonia, to prevent the coagulation of albumen. I have more than once seen the improvement of a patient date from his removal from infected quarters, and I have no doubt but that some of the benefit which is usually credited to change of climate is really produced by removal from infected homes.

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The importance of prophylaxis in the treatment of tuberculosis cannot be over-estimated. Whatever brilliant results may be obtained temporarily by drug treatment, upon prophylaxis must depend to a great degree permanent results. No case of tuberculosis should be called cured until it has withstood new invasions of the disease for four or five years. I am convinced that for fully that length of time a case of tuberculosis which has apparently recovered may carry the slumbering embers of the disease in a partially broken-down gland or secreting cavity, and is prone to new invasions of the disease. It has been shown that the tubercle bacillus can maintain its vitality for a very long period, probably a year, at least in dried-up broken-down tissue. A room containing such dried-up tissue is, therefore, a source of danger to the patient for a long time after he has apparently recovered from the disease, and may be the means of precipitating a fresh attack. The only safe thing for the patient in the light of modern science is, (1) To make his surroundings absolutely free from danger from infection, (2) and to prevent him from reinfecting himself by keeping him in the best possible state of health, so as to be able to resist the disease, and by inhibiting the reintroduction of ejected organisms into the system.

SOME ADDITIONAL STUDIES UPON THE CLINICAL VALUE OF REPEATED CAREFUL CORRECTION OF MANIFEST REFRACTIVE ERROR IN PLASTIC IRITIS.[1]

By Charles A. Oliver, A.M., M.D.,

One of the Attending Surgeons to Wills Eye Hospital; one of the Ophthalmic Surgeons to the Presbyterian Hospital of Philadelphia, etc.

Since the publication of the writer's paper upon this subject, in the transactions of this Society for 1892, he has been able, by a number of fortuitous circumstances both as to material and proper assistance, to make a series of additional studies in order to determine the causal factor of the apparent and transitory increase of ametropia in the same variety of cases as he then had the privilege to study.

Ignoring, as he then did, any cases where there were objective evidences of corneal opacity, lenticular haze, or even the faintest visible disturbances in the aqueous or vitreous humors; excluding all instances where there were any perceptible tags of adhesion between the iris and

[1] Paper read before the American Ophthalmological Society, May 31, 1894, at the Third Triennial Meeting of the Congress of American Physicians and Surgeons.

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the lens; and limiting the work to those eyes where the pupils were seemingly dilated *ad maximum*, a number of experimental studies were instituted to determine, if possible, the cause of the ametropic increase.

(1) To discover whether there is a forward displacement of the lens. This was shown not to occur, objectively, in two ways. The first plan consisted in studying the plane of the iris by the use of ordinary inspection through a corneal loupe upon a brilliantly illuminated area. In this experiment, it was found that in nearly every instance the anterior plane of the iris was either vertically placed or was dragged backward. The second method was accomplished by means of the estimation of the relative positions and sizes of the catoptric images, especially of the two lenticular reflexes. Here it was found that by either roughly testing by a candle-flame or, as in several instances, more scientifically, by recourse to an ophthalmometer of Helmholtz, that whilst the anterior capsular reflex moved forward and became smaller, the posterior one moved slightly backward.

(2) To endeavor to determine clinically whether the index of refraction or whether the actual amount of either the aqueous or the vitreous humor is increased during the inflammatory process. This in measure was shown not to be the case; first by careful and repeated study of the objective appearances of successive layers of these two media, by both oblique illumination, and the ophthalmoscope. No thickening, no visible sign of increase of density of the fluids, as might be evidenced by planes of increased reflection, and even no distortion of any of the gradually deepening meridional reflexes could be conscientiously asserted; second, by reference to the fact that in nearly every case which was carefully studied, the distance between the anterior and the posterior lenticular reflexes was, as before shown, unduly increased. Thus, these two plans to a great degree invalidated the possibility of either any increased amount of the density of the fluid contents or augmentation of the contained material in the two large intra-ocular chambers.[1]

(3) To make certain that the temporary increase of the index of refraction in the type of cases here under special consideration is dependent upon either spastic tonicity of the fibres of the ciliary muscle or congestion with rigidity of the ciliary bodies. In addition to the great number of experiments pursued to formulate the conclusions given in the writer's first paper upon the subject, a number of control tests, with both mydriatic and myotic agents, were made in such a manner as to set aside any confusion or disturbing influence that might

[1] *Vide* article upon "The Proximate Cause of the Transient Form of Myopia associated with Iritis," by A. Schapringer, M.D., in the New York Medical Journal for October 21, 1893, and editorial, "Poor Vision after Iritis," in the May 12, 1894, number of the Philadelphia Polyclinic.

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be supposed to have arisen from the first two categories of cases. This was done by first obtaining the exact corrective lens that was necessary to bring a subnormal vision to normal, care being taken to choose intelligent patients with but slight refractive error. This done, three instillations of two drops each of strong solutions of either atropine, cocaine and atropine, or eserine were made at three-minute intervals, and the ametropia was immediately re-examined, when, in every case in which the inflammatory process had not absolutely subsided, the use of the cycloplegic reduced the apparent amount of the refractive error (ordinarily one-fourth to three-fourths diopter), whilst the myotic, in every instance tried, increased the apparent amount of the ametropia. To recontrol these tests, all of the eyes whilst in a condition of surcharged dosage, as it were, were re-submitted to a few of the most important of the objective tests, when in every instance where the mydriatic was used, the lenticular reflexes were shown to be more greatly approximated, whilst in those cases where the myotic was employed, the lenticular reflexes became further separated.

The conclusion, therefore, is in every instance of this third variety of study not only is so-called "spastic accommodation" proved, but the supposition of the forward displacement of the lens is, in a great measure, denied, and both real and relative increases of aqueous and vitreous humor are confuted.[1]

LEUCOCYTOSIS.[2]

By Wm. S. Carter, M.D.,

Assistant Demonstrator of Pathology, University of Pennsylvania; Pathologist to the Children's Hospital.

Leucocytes may be classified according to their morphology or according to their avidity for certain stains. According to their morphology they are classified into,—

(1) *Lymphocytes*, which are small cells with large nuclei, staining intensely, and almost completely filling the entire cell, leaving only a very small ring of protoplasm. They vary in size from that of a red

[1] A most interesting and instructive example of this group of cases is given by Dr. John T. Carpenter, Jr., of Philadelphia, in the Philadelphia Polyclinic for May 5, 1894, where he cites an instance in which he inadvertently too early ordered a minus correction in a case of plastic iritis at the time when the refractive apparatus was in a condition of functional myopia. Complaints of the patient as the plasticity of the ciliary muscle lessened and the lens regained its normal refractive curvatures soon set matters aright by the substitution of a much weaker correction.

[2] Read before the Philadelphia Society for Clinical Research, May 22, 1894.

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blood-corpuscle or less up to others, being considerably larger, and having a clear ring of protoplasm. These corpuscles do not possess the power of motion, and constitute about 20 per cent. of the leucocytes of the blood.

(2) *Large mononuclear leucocytes* having a round or oval vesicular nucleus and a large amount of clear protoplasm. These cells are several times the size of red blood-corpuscles.

(3) *Transitional leucocytes*, with indentations of the nuclei, so that they have no constant shape. They are usually spoken of as a further stage of the large mononuclear cells. The large cells do undergo this change, but beside these we also find other smaller cells, with nuclei staining intensely, showing this same change in the shape of their nuclei,—indicating a beginning division of this body. The protoplasm of these cells may or may not contain granules, and they have the power of motion. According to Ehrlich the large mononuclear and the transitional leucocytes constitute 6 to 8 per cent. of the leucocytes.

(4) *Multinuclear leucocytes* containing several deeply-stained nuclei, which are often joined together by a thin filament, and not entirely separated. The protoplasm of these cells frequently contain a considerable quantity of granules. Ameboid movements are seen very largely in these cells, and they are chiefly the ones which wander through the vessel-walls in inflammation. The size of these cells is extremely variable, some being but little larger than the small lymphocytes, others being as large as the mononuclear cells. They constitute 70 to 80 per cent. of the leucocytes of the blood.

The other classification of leucocytes, based upon the affinity for certain stains possessed by granules in their protoplasm, is as follows, for human blood:

(1) *Eosinophiles*,—those cells with coarse granules in their protoplasm which take the acid stains. They are called eosinophiles because they stain best with eosin. They may be either mononuclear or multinuclear, and constitute from 1 to 2 per cent. of the leucocytes. It is said that these cells are never phagocytic.

(2) Basophiles,—those cells with granules which stain by dyes, in which the base has the staining power. We know so little of these that as yet they have no practical value. They occur in large mononuclear cells, but are seldom found in the blood of man.

(3) *Neutrophiles*,—those whose granules stain by a neutral mixture of a staining base and a staining acid. These granules are very fine. They occur in the vast majority of leucocytes, and, generally speaking, we may say that, in health, the multinuclear leucocytes containing granules, which do not stain by eosin, are neutrophiles.

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Several distinct varieties of cells depending upon the kind of granulations have been separated in different animals. One cell never contains more than one kind of granulations. Those found in man are mentioned above, and these are also the most important in other animals. In the rabbit there is a small proportion of amphophiles,—those staining by either the acid or basic stain.

Leucocytes have their origin in the lymphoid structures of the body, chiefly in the lymph-glands, and also from the spleen and bone marrow. As to the development of these corpuscles the conclusions reached by Howell[1] are, perhaps, correct. This observer believes that all leucocytes originate as mononuclear cells or lymphoid cells, and that subsequent changes occur in the circulatory stream or in the tissues of the body. The lymph coming from glands contains these small mononuclear cells, and does not contain the other forms to any extent.

It cannot be said positively that the large mononuclear corpuscles do not originate as such, but we often see in the blood colorless corpuscles apparently standing between the lymphocytes and the large mononuclear cells,—some with considerable protoplasm and a deeply-stained nucleus ; others with a vesicular nucleus, but a smaller amount of protoplasm ; and still others with a moderate amount of protoplasm and a semivesicular nucleus.

Concerning the multinuclear form, it is true that scrapings from spleen or bone marrow have shown these cells in considerable number, but when these tissues were fixed and sectioned, these cells were found only in the blood-vessels and *not* in the tissues (Uskow). It is highly probable that many multinuclear colorless cells of bone marrow are not the white corpuscles of the blood. It seems perfectly clear that if multinuclear corpuscles originated as such from the lymph-glands, then we should find them in large quantities in the lymph leaving these glands.

The leucocytes, then, probably all originate as mononuclear cells, and the different morphological forms observed in the blood are only the same cells at different periods of their life-history. The multinuclear form is the oldest of the leucocytes, and it is at this period that most of the cells are destroyed. One scarcely ever sees the mononuclear cells breaking up in the blood. In examining fixed preparations, and also in counting blood (especially in infections, or any condition in which the leucocytes are being destroyed in considerable numbers), one constantly sees a great many multinuclear cells breaking up and liberating their granules and their nuclei. When the destruction is

[1] Journal of Morphology, July, 1890.

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going on very rapidly great masses of these granules are seen surrounding many liberated nuclei,—this is not the grouping of leucocytes due to faulty technique.

As the cells grow old, peculiar changes occur in their protoplasm, and, as a result, we have granules which show certain staining peculiarities. All cells, of course, do not undergo the same change. These granules have been shown to be albuminous in nature. The granules staining by eosin have been considered a secretory product.

Concerning the physiology of the leucocytes we know even less than we do of their origin and life-history. They are unquestionably greatly concerned in many obscure metabolic processes occurring in the tissues of the body, but as yet we do not know how they act in these changes.

We know that certain fibrin factors of the blood arise from the disintegration of the white blood-corpuscles, and we observe rapid destruction of these cells in the clotting of shed blood or in the clotting of blood within the vessels under pathological conditions.

We also know that leucocytes are phagocytic, swallowing foreign bodies, and that they are attracted by substances which are positively chemotactic. The multinuclear leucocytes are especially concerned in phagocytosis and also seem to be the most sensitive to chemotactic reactions.

As it has been stated that certain forms of leucocytes arise from the spleen, the writer removed the spleen from dogs to determine the effect on the leucocytes.

EXPERIMENT I.—Large healthy dog weighing 12.698 kilos.

February 22, 2 P.M. . . . . R. B. C., 7,950,000
W. B. C., 31,250
2.30 P.M. . . . . R. B. C., 7,825,000
Hb = 114 per cent. (by Gowers's app.) . . . . W. B. C., 25,000
5 P.M. Removed spleen while dog was under ether. Operated with antiseptic precautions.
February 23, dog seemed very dull.
Hb = 120 per cent. 1 P.M. . . . . R. B. C., 8,800,000
W. B. C., 65,600
February 24 . . . . . R. B. C., 8,375,000
W. B. C., 51,000
February 25 . . . . . R. B. C., 8,875,000
W. B. C., 43,750
February 26 . . . . . R. B. C., 7,662,000
W. B. C., 35,000

EXPERIMENT II.—Old mongrel, weighing 7.480 kilos.

February 22, 3 P.M. . . . . R. B. C., 7,325,000
W. B. C., 25,000
3.30 P.M. . . . . R. B. C., 7,575,000

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Hb = 110 per cent. . . . . W. B. C., 28,100
4 P.M. Etherized and removed spleen, using all precautions of antisepsis in operating.
February 23, seems dull. Wound clean.
3 P.M. . . . . R. B. C., 7,625,000
Hb = 106 per cent. . . . . W. B. C., 50,000
February 24 . . . . . R. B. C., 7,825,000
W. B. C., 43,750
February 25 . . . . . R. B. C., 7,675,000
W. B. C., 46,850

A third experiment gave practically the same result as the above, —a slight increase in the number of red blood-corpuscles and a leucocytosis which undoubtedly arose from the injury to the peritoneum, for every precaution was taken to prevent pyogenic infection.

The differential count was as follows:

EXPERIMENT I.

	Normal. February 22.	One Day after Removal of Spleen. February 23.	Two Days after Removal of Spleen. February 24.
Lymphocytes	8.0 per cent.	2.8 per cent.	2.6 per cent.
Large mononuclear	4.0 "	1.2 "	2.0 "
Transitional	4.0 "	2.0 "	4.4 "
Multinuclear	83.0 "	94.0 "	91.0 "
Eosinophile	1.0 "	. . . . .	. . . . .

EXPERIMENT II.

	Normal. February 22.	One Day after Removal of Spleen. February 23.	Two Days after Removal of Spleen. February 24.
Lymphocytes	12.0 per cent.	4.3 per cent.	6.4 per cent.
Large mononuclear	2.0 "	1.0 "	1.0 "
Transitional	5.0 "	4.3 "	6.0 "
Multinuclear	80.0 "	90.0 "	85.2 "
Eosinophile	1.0 "	0.5 "	1.5 "

This shows that the leucocytosis was produced by a disproportionate increase of the polynuclear. Of course, the other varieties are relatively less abundant, but not absolutely so. None of them disappeared entirely, but the large mononuclear cells seem to be least abundant after the removal of the spleen.

THE LEUCOCYTOSIS OF PHYSIOLOGICAL STATES.

By leucocytosis let us understand a condition in which the total number of leucocytes in the blood is increased, usually being due to a

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disproportionate increase of the multinuclear variety, although exceptionally one of the other varieties found in normal blood may be increased.

I. *Digestion Leucocytosis.*—In a series of experiments on thirty-five different individuals made by Dr. Hermann Rieder,[1] it was found that a distinct leucocytosis made its appearance about two hours after the ingestion of a meal, reaching the maximum, in three to four hours, and gradually disappearing in six to seven hours. The degree of leucocytosis during digestion is quite variable, sometimes being absent altogether. It does not seem to be affected by the time of fasting before the meal. That it is not due to the physical process of flushing out the lymph-spaces by the fluid absorbed from the alimentary tract is shown by the fact that it is not constantly present and that tea and coffee, or very weak soups, or a meal of carbohydrates, in which the digestive process is an active one, all fail to cause leucocytosis. A mixed diet will cause slight leucocytosis, while a meal of proteids show the greatest increase. Dogs fed upon a pure meat diet show double the normal number of leucocytes, while men on mixed diet show an increase of about one-half the normal number. It is said that vegetarians do not show any digestion leucocytosis.

Children show a more pronounced digestion leucocytosis than adults, but it is questionable if this is as marked as mentioned by some writers.

To determine the effect of different food-stuffs the following experiments were made:

EXPERIMENT I.—Dog; weight, 10.231 kilos. Fasted one day before experiment.

12.45 P.M.	R. B. C.,	6,150,000
	W. B. C.,	12,500
1.15 P.M.	W. B. C.,	15,600
1.15 P.M. Was given large quantity of fresh lean beef (uncooked). Ate very freely.		
4 P.M.	R. B. C.,	6,100,000
	W. B. C.,	28,200

EXPERIMENT II.—Young pup; weight, 4.988 kilos.

1 P.M.	R. B. C.,	5,800,000
	W. B. C.,	18,750
1.30 P.M.	R. B. C.,	6,000,000
	W. B. C.,	25,000
2 P.M. Ate freely of fresh lean beef (uncooked).		
4 P.M.	R. B. C.,	6,100,000
	W. B. C.,	37,500

[1] Beiträge zur Kentniss der Leukocytose, Leipzig, 1892.

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EXPERIMENT III.—Dog; weight, 9.514 kilos.

12.30 P.M. . . . . W. B. C., 17,180
1 P.M. . . . . W. B. C., 20,300
1.15 P.M. Injected into stomach (by means of soft catheter) 125 cubic centimetres of a 50-per-cent. emulsion of cod-liver oil.
2.30 P.M. . . . . W. B. C., 34,370
3.15 P.M. . . . . W. B. C., 40,600
4.15 P.M. . . . . W. B. C., 31,250

EXPERIMENT IV.—Dog; weight, 10.231 kilos.

11 A.M. . . . . W. B. C., 12,500
12 M. . . . . W. B. C., 18,700
1 P.M. Injected into stomach 100 cubic centimetres of 50-per-cent. emulsion of cod-liver oil.
3 P.M. . . . . W. B. C., 28,150
6 P.M. . . . . W. B. C., 36,000

EXPERIMENT V.—The writer having breakfasted at 8 A.M. found his leucocytes at 1 P.M. to be 7,800.

1.30 P.M. . . . . W. B. C., 6,250
1.40 P.M. Ate one pint of corn-starch pudding (made without milk) and drank some tea.
3 P.M. . . . . W. B. C., 6,250
4.30 P.M. . . . . W. B. C., 7,800

EXPERIMENT VI.—Small rabbit, fasted one day before experiment.

4.30 P.M. . . . . R. B. C., 4,700,000
W. B. C., 4,700
5 P.M. . . . . R. B. C., 5,100,000
W. B. C., 3,900
6–8 P.M. Ate a large quantity of lettuce, cabbage, and green grass.
10 P.M. . . . . R. B. C., 5,475,000
W. B. C., 4,700

These experiments confirm the experiments of others in that carbohydrates fail to produce leucocytosis, and that a diet of proteids produces the greatest leucocytosis,—amounting to double the normal number. It has been stated that fats do not produce leucocytosis, but to this the writer cannot agree. In my experiments the degree of leucocytosis after the administration of fats was quite as great as after a diet of proteids. As the fats are absorbed largely through the lacteals, one would naturally expect some alteration in the leucocytes. W. B. Hardy[1] has studied the white blood-corpuscles of daphnia very carefully, and found that when fats were given within a few hours fat droplets were found within the cells, and that even ten to twelve hours afterwards almost every white blood-corpuscle of these animals contained fat droplets.

[1] Journal of Physiology, Vol. XIII.

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The leucocytosis after a meal of proteids has been thought to be a means of disposing of the peptones after their absorption,—of converting them back into coagulable albumens. From the fact that peptonuria frequently occurs in diseases in which leucocytes are being destroyed rapidly (*e.g.*, pneumonia), and that peptones are often found locally in areas in which there is an extensive destruction of leucocytes, it has been supposed that these cells are rich in peptones.

Hofmeister has observed that many karyokinetic figures occur in the lymphoid collections of the intestine during the absorption of nitrogenous foods, and we must also remember that leucocytosis is by no means constant after a mixed diet, and may even be absent after a diet consisting very largely of proteids (Rieder). These facts would indicate that the leucocytes are probably not concerned so much in handling the products of normal digestion as in dealing with some form of intoxication which is apt to occur from this digestion.

II. *The Leucocytosis of Pregnancy.*—The writer has had no experience in examining the blood of pregnant women, but it would appear that the frequency of leucocytosis in this state is overdrawn. According to the results given by Rieder, about one in every five or six cases fails to show leucocytosis, and when it does occur is not at all pronounced, never amounting to double the normal number. The time of gestation and the number of the pregnancy appear to bear no relation to the degree of leucocytosis. The number rapidly returns to the normal after delivery in most cases, although there may be a temporary increase immediately after delivery, probably the result of the loss of blood.

III. *Leucocytosis of the New-Born.*—Almost all children seem to show some leucocytosis when born. This lasts a variable time, and then gradually subsides, usually disappearing in a few days. It is interesting to note that the fractional counts show a relative excess of eosinophiles and also a great abundance of lymphocytes.

IV. *Leucocytosis after Massage.*—You are all familiar with the results recently published by Dr. John K. Mitchell.[1] Examining the ten cases in which a count of the leucocytes was made, we find a decided leucocytosis in four, a slight increase (too slight to be called leucocytosis) in three, and no alteration at all in three, although in two of these three there was a distinct increase in the number of red blood-cells. On the other hand, in one case there was a distinct increase of the leucocytes, although the number of red blood-corpuscles was not affected.

V. *The Leucocytosis after Cold Baths.*—Professor Winternitz first pointed out that patients treated by cold baths, as in the Brand treatment of typhoid fever, showed a leucocytosis which comes on very

[1] American Journal of the Medical Sciences, May, 1894.

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shortly after the bath and lasts several hours. This same condition is produced in normal individuals by cold bathing. Since his first communication Winternitz has studied the effects of thermic and mechanical measures (douches, cold pack, friction) applied to the surface of the body. The maximum increase of red blood-cells was 2,000,000 per centimetre, the Hb was increased 14 per cent., while the leucocytes were trebled in number. The maximum was not always seen at once after the treatment, but often an hour afterwards. The colorless corpuscles began to increase at a time when the red blood-corpuscles were beginning to decrease. Applications of cold to the lower extremities were followed by a diminution of leucocytes in the upper extremities, while blood from the parts to which cold was applied showed an increase of the leucocytes. General application of gentle heat was followed at first by a diminution and, later, by an increase in the number of red blood-corpuscles. Dr. W. S. Thayer has reported twenty cases of typhoid fever treated by the Brand method in Professor William Osler's wards in the Johns Hopkins Hospital, in which the number of leucocytes after a cold bath was about double the normal number. There was no change in the normal proportion of the different varieties of leucocytes. It would appear that the application of cold, like massage, produces leucocytosis in a mechanical way,—the invigorating influence upon the heart, vessels, and tissues causing the stagnant blood of the tissues to hasten back into the blood-vessels.

The Leucocytosis of Pathological States.

I. *The Leucocytosis of Cachexias.*—Malignant growths usually cause a leucocytosis, but quite often it is absent. Just what relation the location or kind of growth has upon the leucocytosis cannot be positively stated. In twelve cases with malignant neoplasms examined by Rieder, eight showed leucocytosis, while four (two cancers and two sarcomas) failed to show it. In nineteen cases examined by Dr. R. C. Cabot,[1] twelve showed leucocytosis and seven did not, most of the latter being either small tumors or cases in which cachexia had not yet developed.

So far as we can judge from the cases reported, those with cancers situated at the pyloric orifice of the stomach seem to show the most pronounced leucocytosis, while those of the uterus or of the lip do so less frequently. However, the number of cases studied is entirely too small to warrant any positive conclusions.

The size of the growth does not seem to affect the number of leucocytes, for Cabot gives two cases of very extensive growth which did not have any leucocytosis.

[1] Boston Medical and Surgical Journal, March 22, 1894.

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A case of rapidly-growing, small, round-cell sarcoma in a child of 2 years, which was seen in Dr. H. R. Wharton's wards of the Children's Hospital, confirms this. The child was admitted, with a mass in right iliac fossa, late in the summer of 1893. It was operated upon, found to be a new growth, and was not disturbed except to remove small piece for examination. Early in December there was moderate distention of the abdomen, child fairly nourished. R. B. C., 3,125,000; W. B. C., 22,000.

February 5, 1894. Child greatly emaciated, abdomen enormously distended, and superficial veins very prominent. There are marked secondary growth in the orbit, on the left arm near the elbow, and over the scapula. R. B. C., 2,800,000; W. B. C., 18,700.

March 15, 1894. Abdomen even more distended. Secondary growths increasing in size very rapidly. Symptoms of metastasis to lung. R. B. C., 1,300,000; W. B. C., 48,000.

Child died March 30, 1894. No necropsy allowed.

Cabot attributes the leucocytosis to the cachexia,—for in two of his cases, in which it was absent at first examination, it was present later, when the cachexia became pronounced. On the other hand, some of Rieder's cases show the usual disturbance of the red blood-corpuscles seen in cachexias without any leucocytosis. That it is not due to the physical state of the blood seen in these conditions (such as hydremia, lessened alkalinity, or altered isotonic equivalent) is evidenced by the fact that in chlorosis, in which these conditions are present, leucocytosis is usually absent. Further, in animals in which the normal condition of the blood has been altered experimentally, there is no change in the leucocytes, as is shown by the following:

EXPERIMENT I.—Dog; weight, 9.070 kilos.

12 NOON.	R. B. C., 7,025,000
	W. B. C., 18,750
1 P.M.	R. B. C., 7,400,000
	W. B. C., 25,000
2.15–2.20 P.M.	Injected, per jugular vein, 250 cubic centimetres normal saline solution at body temperature.
2.35 P.M.	R. B. C., 6,125,000
	W. B. C., 12,500
3.00–3.10 P.M.	Injected 250 cubic centimetres saline solution.
3.15 P.M.	R. B. C., 6,000,000
	W. B. C., 12,500

Urinated very freely.

EXPERIMENT II.—Dog; weight, 12.698 kilos.

12 NOON	R. B. C., 7,525,000
Hb = 100 per cent.	W. B. C., 35,600
1 P.M	R. B. C., 7,800,000
	W. B. C., 31,250

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4.25–4.35 P.M. Injected, per jugular vein, 210 cubic centimetres distilled water at the body temperature.

4.40 P.M. . . . . R. B. C., 6,125,000
Hb = 82.0 per cent. . . . . W. B. C., 40,000
5.00 P.M. . . . . R. B. C., 6,660,000
W. B. C., 31,250
Hb = 90 per cent. 5.25 P.M. . . . . R. B. C., 6,575,000
W. B. C., 31,250

EXPERIMENT III.—Dog; weight, 11.791 kilos.

3 P.M. . . . . R. B. C., 7,350,000
W. B. C., 14,000
3.30 P.M. . . . . R. B. C., 7,250,000
W. B. C., 17,180
3.40–3.45 P.M. Injected slowly, per jugular vein, thirty cubic centimetres of tartaric acid solution (75 grammes in 1000 cubic centimetres).
3.45 P.M. . . . . R. B. C., 7,750,000
W. B. C., 12.500
3.55–4.00 P.M. Injected forty cubic centimetres.
4.05 P.M. . . . . R. B. C., 5,950,000
W. B. C., 15,625
4.10–4.25 P.M. Injected fifty cubic centimetres.
4.25 P.M. . . . . R. B. C., 6,800,000
W. B. C., 28,000
While injecting a larger quantity dog died suddenly,—apparently from direct action on the heart.

From what has been stated, it seems highly probable that the leucocytosis of cachectic states depends upon some special intoxication, which probably arises from the neoplasm causing the cachexia. As it is most marked late in the disease, it may be that it sometimes arises from septic infection, or from metastatic involvement of the lungs or serous membranes.

II. *The preagonal leucocytosis*, observed in many patients who die slowly, can probably be attributed to the same cause,—*i.e.*, some toxemia,—for it is not present in all cases of slow death, and cannot be produced experimentally by chloralizing animals, and causing them to die slowly, as has been shown by Rieder.

III. *The post-hemorrhagic leucocytosis*, observed in man, is quite constant, and usually proportionate to the loss of blood. I have had no opportunity of studying the blood of men after a severe hemorrhage, but have failed to produce leucocytosis in dogs by bleeding experimentally. This is in accord with the experiment of Rieder,—for in his experiments, in which he removed about one-half the estimated total quantity of blood of an animal and did not follow it by saline transfusion, there was no leucocytosis. In one of my experiments (Experiment I) the red blood-corpuscles were reduced to one-half the normal number, with an actual diminution of the white blood-corpuscles.

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EXPERIMENT I.—Dog; weight, 8.163 kilos.

2.30 P.M. . . . . R. B. C., 5,830,000
W. B. C., 21,000
3 P.M. . . . . R. B. C., 5,700,000
W. B. C., 29,800
3.40–4.00 P.M. Bled from external jugular vein, about 450 cubic centimetres in all.
4.05 P.M. . . . . R. B. C., 4,260,000
W. B. C., 16,000
5 P.M. . . . . R. B. C., 4,230,000
W. B. C., 30,000
5.30 P.M. . . . . R. B. C., 4,200,000
W. B. C., 40,000
Next day, dog very weak.
5 P.M. . . . . R. B. C., 2,460,000
W. B. C., 15,100
Second day.
1 P.M. . . . . R. B. C., 2,480,000
W. B. C., 15,600
Died during night.

EXPERIMENT II.—Very large, old, fat dog; weighing 36.280 kilos.

3 P.M. . . . . R. B. C., 7,000,000
W. B. C., 17,200
3.30 P.M. . . . . R. B. C., 7,300,000
W. B. C., 21,800
4.45 P.M. Started bleeding from external jugular.
4.58 canula occluded by clot.
Has lost very nearly 900 cubic centimetres.
5.00 P.M. . . . . R. B. C., 7,000,000
W. B. C., 12,500
5.10–5.13 P.M. Bled about 100 cubic centimetres.
5.15 P.M. Blood very dark. Respiration sighing.
5.15 P.M. . . . . R. B. C., 5,800,000
W. B. C., 31,000
5.20 P.M. Sighing continues.
5.25 P.M. Could get no blood from sticking the ear. Blood of vein is almost black, and shows . . . . . R. B. C., 4,400,000
W. B. C., 24,000
5.35 P.M. Died.

EXPERIMENT III.—Dog; weighing 10.800 kilos. Has leucocytosis from a pleuritis produced experimentally.

3.00 P.M. . . . . R. B. C., 7,600,000
W. B. C., 34,375
3.30 P.M. . . . . R. B. C., 7,200,000
W. B. C., 37,250
4.30 P.M. Bled freely from vein until sighing respiration was observed.
4.45 P.M. . . . . R. B. C., 5,700,000
W. B. C., 37,250

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5.10 P.M. . . . . R. B. C., 5,500,000
W. B. C., 25,000

Dog is very weak.

5.30 P.M. Appears to be dying.

Chest opened. Heart still beating. Blood from right ventricle shows . . . . . R. B. C., 4,500,000
W. B. C., 21,800

These results show that hemorrhage, even when sufficiently severe to cause death, does not produce in dogs (at least in a few hours) a distinct leucocytosis.

The very pronounced leucocytosis, which Rieder produced in dogs by copious bleeding, and then transfusing the same quantity of normal salt solution, probably explains the cause of post-hemorrhagic leucocytosis. Very probably, the leucocytosis seen in man after a hemorrhage, even without transfusion, can be explained by the fact that the tissues of man are richer in the juices of the body, and hence more lymph is available in sudden emergencies. It has been shown by Dr. Wm. E. Hughes and the writer that the absorption of subcutaneous injections of large quantities of saline solution in man, made at the time of copious bleeding, which we recommend in uremia,[1] takes place with a rapidity that is truly astonishing.

MEMORANDUM.

A CASE OF ENTIRE LOSS OF THE URETHRA AND VESICO-VAGINAL SEPTUM.

LILLIE S., aged 33, married, was delivered of her first child in December, 1893.

The labor was prolonged beyond twenty-four hours. The attendant's patience having become exhausted, he applied the forceps, and after pulling until he got tired, put the forceps in the hands of her husband, and had him pull. Between the two the child was delivered.

When she came under my observation, March 1, 1894, in my service at St. John's Hospital, I found her in a most pitiable condition. She had undergone three operations, but without benefit. The entire urethra was gone, and the under surface of the pubic bone was devoid of muscular tissue, and only covered with a thin membranous tissue. The base of the bladder was gone to the vagino-cervical junction. The

[1] Boylston Prize Essay, American Journal of the Medical Sciences, September, 1894.

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upper surface of the uterine cervix was constantly bathed in urine, and all the parts were excoriated and very friable. The whole interior of the bladder was visible to the naked eye, a more distressing condition can scarcely be imagined.

On account of her menstrual period we were unable to operate until March 11.

Assisted by Drs. Simmons, Search and Stuart,—ether having been administered,—the operation was undertaken.

Profiting by the former three unsuccessful operations, which were from behind forward, we determined to pursue a middle course. The operation was designed to form a strong band of tissue, near where the base of the urethra should be, and extending as far into the vagina as seemed practicable, and as far forward as possible. We intended to leave a fistula posteriorly, so that the bulk of the urine would pass out that way, giving a better prospect for union of the coaptated parts. On either side of the vaginal wall strips were dissected up, and denuded of mucous membrane, about an inch in length. Six silkworm-gut sutures were introduced and drawn tightly together. We thus very materially lessened the opening, and had a very fair beginning for a urethra.

March 23, 1894. Twelve days after the operation the stitches were removed, and all had taken well except the anterior one, which had not held perfectly. For the first three days after the operation—the vagina being packed with iodoform gauze—the patient held her urine, and passed it voluntarily.

By this operation we secured a good firm connecting band of tissue from which to work both ways in our future operations. We had also gained very materially in the strength and healthfulness of the surrounding tissues.

April 5, 1894. Anesthetic, ether. Assisted by Drs. Simmons and Wood, we proceeded to close the vesico-vaginal fistula, not desiring to do more to the urethra until this was closed. The previous operation had secured to us about three-quarters of an inch of solid tissue from which to work.

To get the parts better into view, we carried a braided silk thread through the uterine cervix. With this arrangement we were able to draw the parts well down and denude them with much greater ease. The parts having been denuded, ten Chinese silk sutures were introduced as deeply as possible, and avoiding the mucous membrane of the bladder.

All antiseptic precautions were observed throughout, and the vagina again packed with iodoform gauze.

April 17. We removed the stitches; all had done their work but

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one. But from this cause there was no leakage of urine, it all being passed every two hours by the short urethra.

By distending the bladder with Tiersch's solution we found a small opening into the vagina about one-sixteenth inch in diameter.

April 24, 1894. Under ether, assisted by Drs. Simmons, Search and Panton, we attempted to close the small fistula, but were not successful.

May 27, 1894. Under ether, assisted by Drs. Search and Panton again operated. We first closed the very small fistula. We then extended the urethra forward, and narrowed it to about a quarter of an inch in diameter, this time completing the operations as designed in the beginning.

June 9. Stitches removed. The wall of the bladder is complete. The patient can hold her urine while walking or standing, but there is some leakage from the urethra when reclining. This is not to be wondered at when we consider that our only means of closing the meatus is in the hope of contraction of non-muscular tissue.

Few cases have ever came under my care that presented the difficulties that this one did in the beginning. So we made no promises, only said we would try.

Modern methods, which in a word are summed up,—cleanliness,—during the operation and night and day after the operation, had a large share in the success of this series of operations.

This woman's life is now tolerable; before, it was intolerable,

GEORGE G. HOPKINS, A.M., M.D. (Univ. Pa.).

CLINICAL DEPARTMENT.

UNIVERSITY HOSPITAL.

(Service of J. WM. WHITE, M.D.)

DISLOCATION OF THE FIFTH CERVICAL VERTEBRA, WITH DISPLACEMENT OF THE INTERARTICULAR CARTILAGE BETWEEN THE FIFTH AND SIXTH CERVICAL VERTEBRÆ.

HUGH O'D., aged 24 years, was brought to the hospital apparently intoxicated, with the history of having fallen into a cellar. An examination disclosed a trifling scalp wound, which did not expose the skull. There was no evidence of fracture at the seat of the wound or of injury

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elsewhere. After the wound had been dressed the patient complained of weakness of his limbs, and upon investigation it was found that there was distinct loss of power in both legs and both arms. He was put to bed and given one-sixth grain of calomel every two hours with two grains of Dover's powder. The following morning there was complete paralysis of both limbs and the left arm, slight power being still retained in the right arm. The right hand, however, was almost helpless; there was loss of sensation of the entire body below the third rib; the temperature rose to 104° F., the pulse remaining at 76. Later in the day the paralysis of the right arm increased; the temperature rose to 106° F.; the pulse was, however, slow and full; the respirations assumed the Cheyne-Stokes type. The patient complained of moderate pain in the spine between the scapulæ. From the symptoms, Dr. Martin, who saw the case, suspected intraspinal hemorrhage, and the advisability of an operation was considered, but there was no lesion which could be detected by external examination that would serve as a guide to the exact seat of trouble, and it was thought best to defer an operative attack. By evening the conditions were worse, the temperature remained above 106° F., the respirations began to fail, stupor developed, and death in coma soon followed.

Post-Mortem Examination.—Brain: The sinuses contained currant-jelly clots; the veins in the velum interpositum, in the ventricles, and over the entire surface of the brain were distended with blood; no other lesions were detected. *Spinal Column:* On cutting down upon the spinal column a distinct separation was noticed between the fifth and sixth cervical vertebræ. After having removed the laminæ and cord, the fifth vertebra was found freely movable, the interarticular cartilage between this and the sixth was loosened, and had attached to its surface a small fragment of bone which was torn from the surface of the latter. Beneath the periosteum there were small hemorrhages above and below the seat of injury, not large enough, however, to cause pressure; there were also small extradural hemorrhages anteriorly and posteriorly. On removing the dura mater there was found a transverse depression on the cord corresponding to the dislocated cartilage; there were also hemorrhages into the substance of the cord above and below the seat of depression. Sections of the cord at this point showed the gray matter to be dark and distinctly soft, so that its surface presented an exudation. No other lesions were found.

CHARLES H. SCHOFF,
Resident Surgeon.

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ALUMNI NOTES.

THE Appleton prize, consisting of twenty-five dollars' worth of medical publications, offered annually by the firm of D. Appleton & Co. to the candidate passing the best examination before the Board of Medical Examiners of the State of North Carolina, was won this year by Dr. Hubert A. Royster, of the class of '94, whose percentage was 98.93, which was the highest in the history of the board.

Dr. W. H. Nicholson, of the class of '93, has been elected by the board of managers to fill the vacancy in the resident staff of the Pennsylvania Hospital caused by the resignation of Dr. Thomas F. Branson.

NECROLOGY.

Dr. Charles D. Dare, of Bridgeton, N. J., died on August 25, 1894. His death was sudden, and caused by a rupture of the aorta, the result of aneurism. Dr. Dare was one of the most popular physicians of the country, and was for seven years County Physician of Cumberland County. He was 47 years of age.

Dr. Frank Muhlenberg, one of Lancaster's best known physicians, died on September 8, 1894, in the fiftieth year of his age. He was a graduate of the Lancaster High School, Pennsylvania College at Gettysburg, and the University of Pennsylvania. After studying some time in Germany he returned to America, and began practising in Philadelphia. About ten years ago he removed to Lancaster and continued the practice of his profession.

Dr. Thomas Barr McBride, of Philadelphia, died suddenly, of heart-failure, on September 13, 1894, in the thirty-fourth year of his age. He graduated from the University in May, 1884.

INTERNATIONAL OBSTETRICAL CONGRESS.

The International Congress of Gynecology and Obstetric Medicine will be held for the second time at Geneva, in September, 1896. The questions proposed for discussion are:

(1) The treatment of eclampsia.

(2) The surgical treatment of retroflexion and retroversion.

(3) The relative frequency of the various forms of narrowing of the pelvis in different nations.

(4) The best method of suturing the abdominal walls for the prevention of hernial protrusion.

(5) The treatment of pelvic suppurations.

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EDITORIAL.

THE TEACHING OF THE ART OF SURGERY.

ATTENTION has recently been called from a number of sources to the subject of the teaching of surgery. In an able address at the recent annual meeting of the British Medical Association, J. Greig Smith spoke on the *art* of surgery. He dwelt on the thoroughness with which the *science* of surgery is taught, and contrasted in a forcible manner the lack of instruction in the *art*. This condition he very much deplores, and he hopes that a reform may soon be inaugurated. There can be no doubt of the general truth of the statement which the author makes, nor of the necessity for the reform for which he is striving.

Commenting on this address, the *American Lancet* publishes the following editorially: "The teaching of the physician and obstetrician is quite perfect in practical details at the best medical schools and hospitals. Is the student learning anatomy? A demonstrator stands over him and points out the defects in his work and shows how to practically remedy them. Is he studying physiology? The teacher is at hand to direct in moments of doubt. Does he study practical medicine? The teacher shows how to auscultate a chest, and corrects mistakes of observation until the truth is mastered in a practical manner. So in urine-analysis, bacteriology, microscopy, the recognition of separate diseases, the varied phrases, and their practical management. In all these and allied portions of medical art, modern methods have brought the pupil and teacher into the closest relationships. As a result, the student on his graduation has become familiar with actual practice as it will present itself to him during his professional career. The physician is, or may be, fully trained, not only in the science but in the practice of his art. He can learn to make examinations with the skill and deftness of a master before he has attended his first private patient.

"But with the surgeon there is an obvious lack. He is taught the science but not the art. This art is, or should be, like that of a painter or sculptor, perfect in the training of brain and hand so that every touch shall aid in completing the perfect picture in the operator's brain. The painter and sculptor apply long and patient labor, under the direct training of a master, before they acquire the art of this combined hand- and brain-work called painting and sculpture. If the surgeon were

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trained in like manner he would be able to operate upon the living subject under the direct tutelage of a master surgeon. His mistakes would be pointed out at the time of operating, and his correct movement approved. This is the only method of practically teaching surgery.

"We know of no place in the world at which surgery is taught after this method. It is not regarded as proper for an undergraduate to operate; yet the graduates know less than their superiors. It must be also considered that the older surgeons cling rather too tenaciously to the glory and reward attendant upon the successful training of themselves in the art."

To the latter part of the quotation from the *Lancet* we particularly desire to call attention. While it is manifestly impossible to furnish each aspirant for surgical honors with an abundance of operative material in every department, it is at least possible to give the undergraduate a considerable experience in the personal contact with patients, and to at least inculcate the fundamental principles which underlie the art of surgery. The large classes which now throng our medical colleges preclude the opportunity for this personal contact to as great a degree as we could all hope. It has been, however, the custom in the department of Clinical Surgery in the University of Pennsylvania, during the past few years, to utilize this principle to the fullest possible extent. In addition to the class being divided into small sections, which allows each member to see and hear to the best advantage, the students are called down in regular order, and personally take the history and make the diagnosis of the cases as they are presented, being guided, of course, in the examination by the Professor of Clinical Surgery, and receiving such assistance as is necessary; the object being to teach the proper method of examination, and of handling cases by this personal contact. No amount of attention from the benches will adequately supply the knowledge thus gained. In cases that require minor operations the student is asked to perform the operation under the guidance of and with the assistance of Professor White; in the major operations the student acts as the chief assistant, and is thereby benefited to but a slightly less degree than if really performing the operation. In this service, a rich supply of material is available, being drawn both from the hospital wards and from the out-patient department.

The same is true with regard to the use of anesthetics; the students in turn personally administer the ether, under the supervision of a skilled anesthetizer. During the anesthetization instruction is given in the proper methods of administration, in the dangers to be apprehended, and in the proper treatment to be instituted in the event of an

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accident. It must be repeated that such a course does not pretend to graduate a proficient surgeon, but it at least prepares the way for those who expect to continue further in the study of this branch of medicine, and gives others sufficient training to handle intelligently surgical cases in an emergency until they can be transferred to other hands. Another feature of this course is the constant endeavor to teach the students the art of close observation, and to use the senses of sight and of touch to the fullest extent.

The crowded condition of the medical curriculum will scarcely allow of more time being devoted to the teaching of clinical surgery than is now given to this branch in the University, and for further work in this line post-graduate instruction must be depended upon. We feel, however, that this course is one in which the University may justly take pride. This will be particularly appreciated when it is remembered that in the address before alluded to, Mr. Smith indicates that such instruction is not to be had in England, and, according to the *Lancet*, teaching of this kind is unknown in this country.

SALICYLIC ACID IN THE TREATMENT OF PLEURISY.

SALICYLIC ACID was first employed as an antiferment, Kolbe, Bucholz, and Meyer having demonstrated that solutions as weak as 0.4 per cent. had the power of destroying most bacteria. However, the superiority of the drug over carbolic acid and corrosive sublimate was never established, and now it is rarely employed as an external antiseptic. Ewald and Justi first called attention to its antipyretic action, which they proved to be quite pronounced; but other drugs having fewer disadvantages than salicylic acid soon displaced it as an antipyretic, and at present it is seldom employed in pyrexia, excepting in that accompanying acute articular rheumatism. In the treatment of rheumatism the salicyl compounds still hold the same exalted place in the confidence of the profession that they ever did, and as yet they are without formidable rivals. New uses of the drug continue to multiply. We find it recommended as an anthelmintic, intestinal antiseptic, analgesic, cholagogue, and mild caustic.

A few years ago the treatment of pleurisy by salicylic acid was instituted in Germany, and since that time the method has found numerous followers in Europe. Although the usefulness of the drug in pleural effusions has been frequently demonstrated by foreign authorities, it seems to have attracted but little attention in this country. Dock, we believe, is the only American authority who has contributed anything to the literature of the subject. In the *Therapeutic Gazette* for

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February 15, 1893, will be found an elaborate article by the above-mentioned author, in which it is concluded that salicylic acid and its salts are among the most effectual agents in the treatment of pleurisy with effusion. During the last two years we have prescribed the salicylates in many instances, and always with the most happy effects. As a rule, a drachm of sodium salicylate a day is sufficient, but in some instances it is necessary to increase the amount to a drachm and a half. Under this treatment we have found that serous effusions in the pleural sac are much more rapidly removed than by the administration of absorbents, diuretics, and cathartics. When employed early in simple pleurisy, the drug relieves the pain, lowers the temperature, and often arrests the progress of the disease. In tuberculous pleurisy the remedy is of little value, and in empyema, as one would expect, it is absolutely useless. No explanation of this favorable action of the salicylates has yet been given. It is true that they act as diuretics, but it cannot be that they accomplish their good results solely in this manner, for drugs having a more decided influence on the flow of urine are not nearly so effective.

Large Increase of Lunacy in Great Britain.

The forty-eighth report of the British commissioners in lunacy, just issued as a Parliamentary paper, says there were in the kingdom, on January 1, 92,067 lunatics, idiots, and persons of unsound mind, according to the various returns to the commissioners. This number is 2245 in excess of the corresponding returns from the previous year, and shows the largest increase in the number of lunatics yet recorded. The report says: "This large increase calls the more for some special consideration, because it follows an increase of 1074 in the preceding year, that being far above the average for the ten years, 1882 to 1892, which was only 1300. The increase seems to have been fairly general throughout England and Wales, but the predominant feature of the figures is the great increase shown in the county of London, its pauper lunatics numbering on January 1, 800 more than they did a year previously. It is perhaps right in this connection to point out that from the administrative county of Middlesex, which is fast becoming metropolitan, there is shown from last year an excessive increase of 103, against an average for the previous ten years of 42. From one of the tables attached to the report it appears this state of affairs, though alarming, is not quite so serious when considered in conjunction with the increase of population, the ratio being one insane person in 326, as against one in 331 for the previous year."—*Medical Record.*

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MEDICAL PROGRESS.

MEDICINE.

UNDER THE CHARGE OF

WILLIAM PEPPER, M.D., LL.D., AND JAMES TYSON, M.D.,

ASSISTED BY

M. HOWARD FUSSELL, M.D.

THE FREQUENCY OF RENAL ALBUMINURIA, AS SHOWN BY ALBUMIN AND CASTS, APART FROM BRIGHT'S DISEASE, FEVER, OR OBVIOUS CAUSE OF RENAL IRRITATION.

SHATTUCK (*Boston Medical and Surgical Journal*, June 21, 1894) has examined the urine of patients seeking his advice for various ailments. He has used boiling with additions of nitric acid and the Heller test, and considers them the most satisfactory.

He concludes his article as follows:

(1) Renal albuminuria, as proved by the presence of both albumin and casts, is much more common in adults quite apart from Bright's disease or any obvious source of renal irritation than is generally supposed.

(2) The frequency increases speedily and progressively with increasing age.

(3) This increase with age suggests the explanation that the albuminuria is often an indication of senile change.

(4) Though it cannot be regarded as yet absolutely proved, it is highly probable that faint traces of albumin and hyaline and finely-granular casts of small diameter are often, especially after 50 years of age, of little or no practical importance.

THROMBOSIS OF CEREBRAL SINUSES IN CHLOROSIS.

KOCKEL (*Deutsches Archiv für klinische Medicin*, Vol. LII, Parts 5 and 6, 1894) reports two cases of thrombosis of the cerebral sinuses.

Case I had been chlorotic for a long time. Three days before admission to the hospital she was seized with severe headache, and became unconscious on the third day. There were no paralyses, and the patient died unconscious in a few hours. At the post-mortem the ventricles were found distended with fluid. The vena magna Galeni was found plugged with a clot which had its origin in a clot in the left lateral sinus. The white brain-substance was pale; the ganglia rather red, but nowhere any sign of a hemorrhage.

Case II had exactly the history of the first case. At the section the vessels at the base of the brain were found filled with fluid blood. On opening the lateral ventricle a large area of softening was found covering its borders and the ganglia. The vena magna Galeni was found filled with a clot which sprang from a thrombus in the right cerebral sinus. In the softened parts of the brain were

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punctiform hemorrhages. A great number of the small vessels were filled with clots, and these vessels were surrounded by small-celled infiltrations. The picture in this case is very like the primary hemorrhagic encephalitis described by Strümpell, but it must have its cause in the plugged sinus and is not primary. He believes that some of the cases of primary hemorrhagic encephalitis are really softening due to sinus thrombi, and that the term should be limited to those cases without such thrombi. Some fifteen cases of thrombi of the lower extremities in chlorosis are mentioned, and three of thrombosis of the pulmonary arteries.

Primary Nasal Diphtheria.

Townsend (*Boston Medical and Surgical Journal*, May 24, 1894) reports seven interesting cases of nasal diphtheria, and draws the following conclusions:

(1) Primary nasal diphtheria may occur of a very mild type.

(2) These cases are especially dangerous, as they are likely to go unrecognized for the following reasons:

(*a*) The resemblance of these cases to ordinary coryzas, a membrane not being noticed in some cases except by careful scrutiny.

(*b*) The normal or only slightly elevated temperature often present, with but little constitutional disturbance.

(*c*) The intermittent character of the nasal discharge, absent for a few days and then starting up again.

(*d*) The apparent recovery, even the cessation of nasal discharge, while Klebs-Löffler bacilli are still present.

(*e*) The fact that these bacilli have not lost their virulence; or, in other words, the fact that the patient having bacilli in his nose, although apparently well, may transmit the disease in a fatal form to others.

(*f*) The difficulty of always finding the bacilli in the nose, even when they are present.

(3) The importance of bacteriological examinations in all suspicious cases of nasal discharge.

(4) The importance of prolonged isolation, together with a refusal to consider a case cured until several consecutive negative cultures have been obtained.

Therapeutic Value of Lysol in Internal Medicine.

Maass (*Deutsches Archiv für klinische Medicin*, Vol. LII, Parts 5 and 6) first experimented with animals, administering lysol to them in different doses. He found it entirely harmless, and then administered it to men. Cases of catarrh of the stomach where there was interference with digestion were observed. The stools of these patients were examined for bacteria, and in all cases the colonies of bacteria decreased after the use of the lysol. He discovered, however, that it is necessary that the intestinal contents be fluid in order that they may be disinfected.

The urine of a man with advanced phthisis was found to contain a large amount of indican. During the use of lysol, the blue coloration due to indican entirely disappeared. The amount of sulphuric acid was not increased in the slightest degree by the use of lysol. Neither did its use either increase or diminish the amount of urine excreted. The dose of the drug is from one to six grains given in solution or in capsule.

He believes it will prove of value where a direct disinfectant is needed for the mucous membranes. He has used it as a gargle, 5 parts to 100, in angina, and in a 1-per-cent. solution as a nasal wash.

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LEPROPHOBIA.

LUTZ (*Journal of Cutaneous and Genito-Urinary Diseases*, December, 1892) describes a curious mental condition among neurasthenic individuals who have a history of leprosy in the family, or who have lived with lepers, or who perhaps have simply come in contact with lepers. They believe themselves to be lepers, and go from physician to physician until one is finally found who gives leprosy as a possible diagnosis. For a while the patient is satisfied, but he soon sinks into the deepest depression. The author admonishes the physician to be very certain in his diagnosis of leprosy, and to make a diagnosis only on the most positive points. That the transmission of the disease from man to man among civilized nations is very rare, and that the teaching of the long incubation stage is largely a fable.

THE TREATMENT OF LEPROSY WITH EUROPHEN.

GOLDSCHMIDT (*Therapeutische Monatsheft*, April, 1893) has used europhen in five cases of leprosy. In one he used it for fifteen months, and the case recovered. In this patient there were leprous patches on the angle of the mouth, chin, eyelid, point of the nose, and on the leg. A 5-per-cent. europhen oil was used and rubbed into the spots three times daily for five minutes at a time. After four weeks of treatment the patient was better, and after fifteen months the point of the nose was alone somewhat reddened.

HEMATOPORPHYRINURIA AND ITS TREATMENT.

MÜLLER (*Wiener klinische Wochenschrift*, 1894, No. 14), after inveighing against the too general use of the coal-tar products as a probable source of much more mischief to the economy than good, quotes some cases of sulphonal-poisoning, and gives their treatment.

Sulphonal, as well as trional, acts after long use in a deleterious manner upon the red corpuscles, destroying the coloring matter and causing hematoporphyrin (iron free hematin) to be excreted. If the excretion of this substance is continued for any length of time the case becomes incurable, notwithstanding the withdrawal of the sulphonal, and the patient dies. As a rule, this symptom of sulphonal poisoning, the excretion of hematoporphyrin, follows a series of symptoms, and it may be accompanied by them,—to wit, vertigo, failure of memory, sleepiness, staggering gait, ataxia, and disorders of speech. By further use severe obstipation appears, with severe colicky pains and periodical vomiting. At this point the urine becomes dark-blue red, and in severe cases becomes the color of cherry juice. Before the color of the collected urine can be noticed there are sometimes discolored spots on the bed-linen or on the underclothing of the patient.

Unexceptionally the urine has a highly acid reaction, and shows the characteristic absorption bands for hematoporphyrin by the spectroscope. If the drug is still continued, the patient becomes bedridden, and is the picture of extreme prostration. One patient showed all the above symptoms who had taken sixteen grains of sulphonal daily for five months. The writer, taking into consideration the high degree of acidity, administered a drachm and a half of bicarbonate of soda daily. After four days the urine became neutral and then alkaline. After three weeks of this treatment the urine had lost its color, but upon the cessation of the use of the alkaline treatment it again became of the characteristic color. Four months after the beginning of the treatment, however, the patient had lost all the bad symptoms, and had apparently recovered.

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A second case showed these symptoms with less intensity after having used sulphonal for two months in the dose of eight to fifteen grains.

The author concludes that sulphonal should never be given continuously for a long time unless there is obtained daily a large bowel movement, and at the same time an alkali is administered.

The Treatment of Whooping-Cough with Quinine.

Baron (*Berliner klinische Wochenschrift*, No. 48, 1893) reports on fifty cases of whooping-cough treated after the old manner of Benz-Ungar, which they advocated in 1868. In a few children the good action of the quinine was noticed in two or three days, but in most of the children the results were shown after several days.

The first evidence of value is the lessening of the night attacks. The improvement continues until health is restored, unless the dose be too suddenly reduced. The author continues the administration of the quinine for three weeks. Relapses do not occur in children treated with quinine. In spite of the fact that the quinine was not given as regularly as directed in more than half the cases, there were only two failures noted. The treatment is of unusual value in the cases of acute inflammation of the lungs caused by the whooping-cough.

Since the thorough trial of quinine, whooping-cough has lost all its terrors to the author.

The proper dose of quinine is one-sixth of a grain for each month of the child's age, and one-and-a-half grains for each year, given three times in the day, at six A.M., and two and ten P.M. More than six grains three times daily is not necessary for older children. As the case improves, the number of daily doses is decreased.

Antiseptic Treatment of Tubercular Phthisis.

Foxwell (*Birmingham Medical Review*, July, 1894) gives a general review of the different substances now employed in the treatment of phthisis. He lays great stress upon the free use of iodoform. He believes this drug the most satisfactory of the various antiseptics used in phthisis.

He quotes one case at length, and arrives at the following conclusions:

(1) We should never give up hope in a case of phthisis.

(2) The case bears out Gosselin's experiments of 1887, in which he inoculated animals with tuberculosis, and afterwards injected iodoform. He found the disease delayed but the bacilli alive.

(3) The remedy should be continued for a long time after *all* symptoms of the disease have disappeared.

(4) A daily dose of twenty to thirty grains can be taken for a long time without any ill results, and such a dose should be administered. The dose should be six grains daily in the beginning, and increased every other day until thirty grains are taken daily.

Megalogastria and Gastroectasia.

Riegel (*Deutsche medicinische Wochenschrift*, April 12, 1894) reports a case of a man with a slight valvular lesion of the heart in which the physical examination showed great dilatation of the stomach. There were no symptoms of any disorder of digestion whatever. The muscular strength of the stomach, and its

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powers of digestion, as proved by the various methods, were both perfect. He claims that gastroectasia should not be applied to such cases, but prefers the term megalogastria, believing it to be virtually a congenital condition.

There are three ways in which the motor strength of the stomach can be determined in relation to its size.

The motor power is lessened,—

(1) When the size of the stomach is normal, and in spite of this the contents are retained in the stomach for digestion longer than the normal time. This is the true atony or insufficiency of the stomach.

(2) When the contents of the stomach are retained longer than normal, and there is at the same time dilatation. This is gastroectasia, or the so-called atonic ectasia.

(3) If the contents are digested in the normal time, and the stomach is still dilated. The case belongs to the group of megalogastria or congenitally enlarged stomach.

In this last group the stomach may readily become atonic if prophylactic measures are not undertaken.

The fluids should be lessened, and meal times should be so regulated that there will be a normal relation between the work and rest of the stomach.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

ASSISTED BY

G. G. DAVIS, M.D., M.R.C.S., AND ELLWOOD R. KIRBY, M.D.

APPENDICITIS.

J. WILLIAM WHITE (*Therapeutic Gazette*, June 15, 1894) discusses some of the unsettled points in reference to appendicitis, particularly as to its treatment. The following is a summary of his views:

(1) The explanation of the great frequency of inflammation of the appendix is to be found in the following facts:

(*a*) It is a functionless structure of low vitality removed from the direct fecal current. It has a scanty mesentery so attached to both cecum and ileum that it is easily stretched or twisted when they become distended. It derives its blood-supply through a single vessel, the calibre of which is seriously interfered with or altogether occluded by anything which produces dragging upon the mesentery.

(*b*) In addition, there is almost always present a micro-organism,—the bacterium coli commune,—capable of great virulence when there is constriction of the appendix or lesions of its mucous coat or of its parietes.

(2) The symptoms in a case of mild catarrhal appendicitis—general abdominal pain, umbilical pain, localized pain, and tenderness on pressure in the right iliac fossa, vomiting, moderate fever, and slightly-increased pulse-rate—cannot at present, with any certainty, be distinguished from the symptoms, apparently

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precisely identical, which mark the onset of a case destined to be of the very gravest type.

(3) It must be determined by future experience whether or not operation in every case of appendicitis, as soon as the diagnosis is made, would be attended by a lower mortality than would waiting for more definite symptoms indicating unmistakably the need of operative interference. At present such indication exists in every case if the onset is sudden and the symptoms moderately severe, and whenever in a mild case the symptoms are unrelieved at the end of forty-eight hours, or, *a fortiori*, if at that time they are growing worse.

(4) It must be determined by future experience whether cases seen from the third to the sixth day, which present indications of the beginning circumscription of the disease by adhesions and which tend to the formation of localized abscesses, will do better with immediate operation with the risk of infecting the general peritoneal cavity, or with later operation when the circumscribing wall is stronger and less likely to be broken through. At present, operation is certainly indicated whenever a firm, slowly-forming, well-defined mass in the right iliac fossa is to be felt; or, on the other hand, when a sudden increase in the sharpness and the diffusion of the pain and tenderness points to the perforation of the appendix or breaking down of the limited adhesions.

(5) In the beginning of general suppurative peritonitis operation offers some hope of success. In the presence of general peritonitis with septic paresis of the intestines operation has thus far been useless.

(6) Recurrent appendicitis of mild type, like acute appendicitis, frequently results from digestive derangements. Several attacks may occur followed by entire and permanent recovery, but it is as yet impossible to differentiate these cases accurately from those which do not tend to spontaneous cure. Operation is certainly indicated whenever the attacks are very frequent.

(7) Chronic relapsing appendicitis is characterized by the persistence of local symptoms during the intervals and by more or less failure of the general health. It usually indicates operation.

(8) In either the recurrent or the chronic relapsing variety operation should be advised according to the following indications formulated by Treves. Whenever—

(*a*) The attacks have been very numerous.

(*b*) The attacks are increasing in frequency and severity.

(*c*) The last attack has been so severe as to place the patient's life in considerable danger.

(*d*) The constant relapses have reduced the patient to the condition of a chronic invalid, and have rendered him unfit to follow any occupation.

(*e*) Owing to the persistence of certain local symptoms during the quiescent period, there is a probability that a collection of pus exists in or about the appendix.

Extragenital Syphilitic Infection.

Krefting (*Archiv für Dermatologie und Syphilis*, Band xxvi, Heft 2) has reported 539 cases of extragenital syphilitic infection; 4.3 per cent. of the cases were in men, and 32.8 per cent. were in women.

About three-quarters of all the cases seen were infected by drinking-glasses.

Fifty-one per cent. the chancre was located upon the hip; 20 per cent. in the throat; 3.5 per cent. on the tongue.

The author says many children are infected through the breast.

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Practical Management of Strictures of the Urethra.

Cole (*New York Medical Journal*, March 3, 1894) advises the follov course in treating urethral strictures:

(1) When the symptoms point to urethral difficulties, accurately deterr the conditions present, using for this purpose the hard-rubber, olive-poi bougies of small size, or the bulbs of larger size, or the urethrometer.

(2) If a contracted meatus or constriction within an inch of the me obtains, immediate meatotomy and a careful subsequent examination of the w urethra.

(3) For resilient or pliable strictures in the penile urethra, divulsion u cocaine; in the bulbo-membranous urethra, the passage of sounds and mass and in aggravated cases perineal incision under general anesthesia; and in ei case anesthesia is permissible.

(4) For tough (fibrous, etc.) strictures, urethrotomy (internal) in the pe urethra; perineal section in the bulbo-membranous, always under an anesthet either case.

(5) Careful and continuous after-treatment by the passage of sounds massage at the site of the exudation while the sound is in the urethra.

(6) In all cases scrupulous cleanliness, a clear conception of the case f beginning to end, and a frank statement to the patient of what it is proposed tc

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Tenotomy for Contracted Tendons following Infantile Paralys

Phelps (*New York Medical Journal*, February 24, 1884), in certain case contracted tendons resulting from infantile paralysis, advises division of the don instead of attempting to stretch the parts. He gives the case of a boy contraction of the tendo Achillis in which it was impossible to bring the feet right angle. The patient had been told by a prominent English surgeon tha should "allow no American surgeon to operate on his tendons, else his feet w surely be ruined." Conservative measures were also advised by three other geons, but the child recovered quickly and satisfactorily after the operation, a perfect functional result, thus demonstrating the correctness of the treat pursued.

Removal of Fibrous or Naso-Pharyngeal Polypi.

Annandale (*Lancet*, February 17, 1894) submits the following as his co sions on the removal of naso-pharyngeal polypi:

(1) That unless the tumor is seriously interfering with the respir during the administration of the anesthetic, preliminary tracheotomy is no quired.

(2) That chloroform is the best anesthetic.

(3) That the position of the head should be dependent,—that is, hanging over one end of the operating table.

(4) That the following method of operating allows the tumor to be suffici exposed and rapidly removed:

(*a*) The chloroform having been administered, and the head placed in dependent position, the mouth is kept open by an efficient gag.

(*b*) A loop of strong silk is passed through each side of the soft palate, e nally to and about one inch above the uvula. These loops are left long, and held by an assistant, so as to steady the soft palate.

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(*c*) The soft palate is then rapidly divided in the middle line with a sharp knife along its whole extent, and through both of its layers of mucous membrane, and its two halves are drawn apart by pulling upon the thread loops.

(*d*) The tumor is now quickly enucleated or separated from its surrounding connections down to its attachment to the bone with a blunt periosteal elevator, assisted by the finger.

(*e*) Thereupon, the neck of the growth is seized with a pair of strong forceps close to its attachment to the bone, and wrenched or twisted off. If the attachment passes up into the nasal passages, this portion will be most readily separated by introducing the same strong forceps through one or the other anterior nostril, the working of the forceps being assisted by the fingers of one hand passed up behind the soft palate.

(*f*) When the tumor has been thus removed the nasal cavities should be plugged with iodoform gauze, and the halves of the soft palate stitched together. The thread loops may be retained until this stitching has been done, as they are useful in steadying the palate; after this they should be removed.

A Case of Dilatation of the Stomach Cured by Means of a Heineke-Mikulicz Operation.

Löwenstein (*Münchener medicinische Wochenschrift*, May 22, 1894) says the most common cause of dilatation of the stomach is stenosis of the pylorus. In the surgical treatment of gastric dilatation two methods are to be considered,—

(1) That which deals with the obstruction alone (gastro-enterostomy).

(2) That which removes the obstruction, and at the same time decreases the size of the dilated organ by a partial gastrectomy.

Of eighteen cases of gastro-enterostomy, collected by the author, there were six deaths; of twenty-two cases of resection of the pylorus, there were seven deaths.

The exact number of cases that have been treated by the Loreta operation could not be collected.

The Treatment of Cystitis by Instillations of Bichloride of Mercury.

Colin (*Thèse de Paris*, 74 pp., 1894) reports thirty-four cases treated by sublimate instillations, twelve were cured, nine greatly improved, nine improved, while no change was noticed in the remaining four. The good results noted in cases of ordinary cystitis have been likewise seen in cases of tuberculosis and gonorrhea of the bladder.

In the tubercular variety of cystitis, the instillations give almost immediate relief from pain and tenesmus.

The instillations are to be made by Guyon's method. At first the injections should be made at intervals of two days, but later every day, and the strength of the solution gradually increased.

The strongest solutions required are 1 : 1000 to 1 : 500.

As to the quantity of fluid that should be injected, the author recommends five to ten grammes should be injected into the bladder, and ten to fifteen drops should be deposited near the neck of the bladder and in the posterior urethra.

Guyon, in 1891, made some experiments as regards the strength of a bichloride solution that could with comfort be injected into the bladder. He found that when the bladder was irrigated with a solution stronger than 1 : 4000, there was great pain and tenesmus. If, however, the solution was used in much smaller quantities as strong as 1 : 500 might be used without any disagreeable after effect.

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A New Treatment for Chronic Empyema.

Delorme (*Gazette de Hôpitaux*, No. 11, 1894) describes a new operation for the treatment of chronic empyema, which is intended to do away with the Estlander operation.

The pleural cavity should be exposed by a large flap opening in the chest.

The skin flap should reach from the third to the sixth rib, the ribs and intercostal muscles are now divided to correspond with the skin flap, and also turned back. Through this opening the entire lung may be stripped of its pyogenic membrane. The rib and skin flaps are now turned down and sutured in place, complete long union always takes place.

In this operation the lung can be readily freed from the pyogenic membrane.

This is a rational operation and is more conservative than the Estlanders, and permits in most cases of a complete restoration of the respiratory functions of the compressed lung.

Tumor of the Bladder.

Guyon (*Annales des Maladies des Organes Génito-Urinaires*, January, 1894) gives the following operative technique in the removal of vesical growths: The incision should be a longitudinal one and extend two or three fingers' breadths above the bladder. This latter should be entered at its highest point. From this point it can be prolonged to the symphysis or even to the neck of the bladder. He has done symphyseotomy in the removal of a large growth. The growth being seized with forceps it can be removed with the cautery knife or the galvanic loop. The principal thing is to see well, therefore it does not suffice to have a long incision, suitable retractors, a good light, and the aid given by raising the pelvis, but one must do the removal as already indicated by a bloodless method. To remove the stumps they are to be transfixed with a tenaculum and drawn upward towards the wound in the abdominal walls, then treated. If preferred, the bistoury can be used and the vessels ligated with catgut. The wound made in the bladder walls by the removal of the base of the tumor can be approximated by a few catgut sutures. The line of incision in the bladder is then sutured shut, as is also that in the abdominal walls.

A New Cystoscope.

Boisseau du Rocher (*Annales des Maladies des Organes Génito-Urinaires*, January, 1894, p. 51) describes a new instrument which is designed to give a better and more complete view of the interior of the bladder than those heretofore used without the necessity of removing or reintroducing it. The apparatus consists of a hollow tube bearing the lamp. This lamp has two fenestra instead of only one, as in the Leiter instrument. At the angle of the beak on its convexity is a window, and on the shaft on the opposite side near the beak is another window. A stylet or mandril is used in the tube when it is introduced. This closes the two windows. The instrument once in place the mandril is removed, and another tube bearing the optical apparatus introduced. Different tubes are used for the windows on each side. The different parts of the bladder can thus be inspected without the necessity of using different cystoscopes, or even of reintroducing it. If bleeding occurs the optical tube is removed, and the bladder washed out through the tube bearing the lamp, and the optical tube then reinserted. Different eye-pieces can also be adopted to the instrument. The diameter of the instrument at its largest part is No. 22, French scale.

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THERAPEUTICS.

UNDER THE CHARGE OF

HORATIO C. WOOD, M.D., LL.D., AND ARTHUR A. STEVENS, M.D.

THE DIETETIC TREATMENT OF PHTHISIS.

LOOMIS (*Practitioner*, No. 311, 1894) makes the following suggestions regarding the dietetic treatment of phthisis:

(1) Never take cough mixtures if they can possibly be avoided.

(2) Food should be taken at least six times in the twenty-four hours; light repasts between the meals and on retiring.

(3) Never eat when suffering from bodily or mental fatigue or nervous excitement.

(4) Take a nap or at least lie down for twenty minutes before the mid-day and evening meals.

(5) The starches and sugars should be avoided, as also all indigestible articles of diet.

(6) As far as possible each meal should consist of articles requiring about the same time to digest.

(7) Only eat so much as can be easily and fully digested in the time allowed.

(8) As long as possible systematic exercise should be taken to favor assimilation and excretion; when this is impossible, massage or passive exercise should be undergone.

(9) The food must be nicely prepared and daintily served,—made inviting in every way.

The following diet-sheet is suggested for the early stage: On awakening, eight ounces of equal parts of milk and seltzer, taken slowly through half an hour. Breakfast: oatmeal and cracked wheat with a little sugar and an abundance of cream, rare steak or loin chop with fat, soft-boiled or poached egg, cream toast, half pint of milk, and small cup of coffee. Early lunch: half pint of milk or small tea-cup of squeezed beef-juice with stale bread. Mid-day meal: fish, broiled or stewed chicken, scraped meat-ball, stale bread and plenty of butter, baked apples and cream, and two glasses of milk. Afternoon lunch: bottle of Koumyss, raw, scraped beef-sandwich, or goblet of milk. Dinner: substantial meat or fish soup, rare roast beef or mutton, game, slice of stale bread, spinnach, cauliflower, fresh vegetables in season (sparingly).

EFFECT OF MERCURY ON THE KIDNEYS.

WELANDER (*Hygeia*, LVI, 2, 1894) has had the opportunity of observing ninety-seven cases of syphilis before treatment with mercury, and during the administration of the drug. He found that its elimination was accompanied by a greater or less irritation of the kidneys, manifested by casts in the urine. These casts increase in proportion to the length of the treatment, gradually decrease after its cessation, and generally disappear within a month or six weeks. No injury to the kidneys, either temporary or permanent, was observed. (*Universal Medical Journal.*)

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The Treatment of Enteric Fever with Killed Cultures of Bacillus Pyocyaneus.

Kraus and Buswell (*Wiener klinische Wochenschrift*, July 12, 1894) have made some experiments to determine the antagonism between pyocyaneus products and the typhoid bacillus in the body. Instead of thymus extract cultures, they used bouillon cultures heated to between 60° and 80° C. for twenty minutes. These higher temperatures were used, as one animal injected with an apparently sterilized culture died of the pyocyaneus infection. Enteric fever in man is not a simple infection, but a middle form between infection and intoxication. Three guinea-pigs were inoculated with one-half cubic centimetre of sterilized pyocyaneus culture, and a week later with 3 cubic centimetres virulent typhoid culture. The three control animals died within twelve hours, whereas the others not only lived but were active and lively on the next day. The action really lies in an increase in the natural resistance. Toxalbumins are destroyed at 70° C., and the poisonous toxines have little significance in this relation. The bacterial protein, however, preserves its powers even after being heated to 120° C.; it constitutes the most important part of sterilized bacterial fluids. The authors believe that the real object to be aimed at in the injection of bacterial protein is to make the inflammatory and febrile reaction more marked.

Glycerin in Hepatic Colic.

Ferrand (*L'Union Médicale*, May 8, 1894) states that he has obtained good results with glycerin in the treatment of hepatic colic. On the appearance of an attack he administers by the mouth from one-half to one ounce of glycerin. He believes that the drug is rapidly conveyed to the liver where it exerts a marked cholagogue effect and thus aborts the attack of colic. One to three drachms of glycerin daily, in some alkaline water, it is stated, is sufficient to prevent a recurrence of the attacks.

Para- and Ortho-Chlorphenol in Tuberculous and Other Diseases.

N. Simanoffski (*Vratch*, No. 8, 1894) has used solutions of monochlorphenol in glycerin in the strength of 5 per cent., 10 per cent., and 20 per cent., and points out as special features of these very powerful disinfectants that they do not irritate the mucous membrane, even if applied in a 20-per-cent. solution; that they form no stable combination with the tissue albumens, and that they are, therefore, able to penetrate into the depth of the diseased organ. The tuberculous cases treated were mostly very advanced and serious affections of the throat with impairment of voice and difficulty in swallowing. In one case there was, besides these symptoms, a tuberculous ulcer at the root of the tongue; in another a similar ulcer on the whole posterior wall of the pharynx and part of the naso-pharyngeal region. All cases without exception, even including the last one in which there was a very advanced affection of the lung, improved quickly under the local treatment with monochlorphenols; the ulcers became clean and showed a tendency to heal, and all the accompanying symptoms disappeared. Equally good results were obtained in chronic thickening and hyperplasia of the mucous membranes, which disappeared after a few applications of the same solutions. Simanoffski is of opinion that the monochlorphenols will find a large field of application in diphtheria, etc., and he unhesitatingly recommends them in laryngological practice in preference to iodoform, pyoktanin, menthol, etc., especially as they also possess anesthetic properties.

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Ergot in the Night-Sweats of Phthisis.

Goldendach (*Deutsche medicinische Wochenschrift*, No. 20, 1894) states that, from a knowledge of the action of ergot on the vaso-motor nerves, he was led to employ it in the colliquative sweats of phthisis. He first administered one or two five-grain powders at bedtime. The results were excellent, the remedy rarely failing to do good. Lately he has substituted ergotin for the powdered drug, and claims that its action is even better and more constant than that of the latter preparation. The ergotin is administered hypodermically, and is prescribed as follows:

℞ Ergotin, 3 parts.
Diluted alcohol,
Glycerin, } of each 5 parts.
Distilled water,
One cubic centimetre every evening.

The Antitoxin Treatment of Diphtheria.

Katz (*Lancet*, II, 1894) has obtained excellent results with Aronson's antitoxin in diphtheria in the Emperor and Empress Frederick's Children Hospital, under Professor Baginsky's superintendence. In the last three years, 1891–1893, 1081 cases of diphtheria have been treated in the hospital, of which 421, or 38.9 per cent., died, the mortality in the respective years being 32.5 per cent. in 1891, 35.4 per cent. in 1892, and 41.7 per cent. in 1893. From the commencement of this year up to March 14, 86 cases have been treated, with 38 deaths, or a mortality of 41.8. On the latter date the antitoxin treatment was commenced and employed in 128 out of 151 cases admitted to the hospital, 23 cases not being subjected to it for various reasons. In the 128 cases so treated only 17 deaths occurred, the mortality thus falling from 41.7 to 13.2 per cent. In all his clinical observations Dr. Katz is able to say that on no occasion could any deleterious effect be ever attributed to the employment of the antitoxin solution. If renal inflammation did occur, it followed quite a normal course, no bad effect could be observed upon the rhythm or tone of the heart and pulse.

Katz also inoculated 72 children exposed to the disease in order to determine the prophylactic value of the remedy. Of the 72 inoculated, only 8 were attacked, and so slightly as to be free from any evil consequences. The author states that in the records of the hospital there has never been so favorable a result in a series of diphtheria cases since the introduction of the antitoxin treatment.

The Hypodermic Injection of Magnesium Sulphate as a Purgative.

Fincke (*Medical News*, August 25, 1894) has made some experiments to test the purgative properties of magnesium sulphate when hypodermically administered. In September, 1893, Rohé and Wade reported that they had employed the drug in this manner in forty-six cases, with the following results: The number of injections made was 100. In 67 per cent. the injection was successful, in 33 per cent. it failed. The dose varied from 1.86 grains to 4.5 grains. It was found that small doses acted as efficiently as slightly larger doses. In only one case was the dose (4.5 grains) employed. The shortest time for the injection to produce an evacuation was three hours, the longest fourteen.

Fincke's results have not been so satisfactory. Twenty-five cases were selected,

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and fifty injections of from one to six grains were made. The average dose was 2.78 grains. In the majority of cases the results were negative. In order to compare with the foregoing the action of magnesium sulphate given in the usual doses by the mouth, eleven cases were selected, and in these, with one exception, the results were negative with hypodermic administration. The results obtained in all cases by the two methods of administration were as follows: *Hypodermically:* success, 18 per cent.; failure, 82 per cent. *By the mouth:* success, 72.7 per cent.; failure, 27.3 per cent. While the author does not consider the number of hypodermic injections as conclusive, he still believes that the foregoing results cast considerable doubt upon the purgative property of magnesium sulphate exhibited hypodermically in small doses.

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OBSTETRICS.

UNDER THE CHARGE OF

BARTON COOKE HIRST, M.D.,

ASSISTED BY

RICHARD C. NORRIS, M.D., AND FRANK W. TALLEY, M.D.

Rupture of the Sinus Longitudinalis in Forceps Delivery.

J. C. Webster, of Edinburgh (*Edinburgh Medical Journal*, January, 1892), reports, in a demonstration of the skull, a case of labor in which from flat pelvis of three and a quarter to three and a half inches conjugate, the transversely-presenting head was delivered from the superior strait with the axis-traction forceps. The child was asphyxiated, and died. There was a considerable blood extravasation on the convexity of the cerebrum reaching below to the base of the medulla. The sinus longitudinalis was ruptured through the great degree of telescoping of the skull bones in fronto-occipital direction.

A Case of Cervical Pregnancy.

Siegfried Stocker, of Luzerne (*Korrespondenzblatt für Schweizer Aerzte*, Jahrgang XXIII, No. 23), describes a case of primary cervical pregnancy with cervical placenta formation in a 37-year-old III-para. The case presented the following peculiarities:

(1) There existed no connection with the cavity of the uterus.

(2) There was throughout strong adhesion of the ovum with the cervical wall.

(3) The separation of the ovum was attended with copious hemorrhage that continued after the removal of the ovum, as the cervix was without power to contract.

(4) The external os was so dilated that, from the absence of a pedicle, the ovum must have been expelled through the force which dilated the external os had there been no union of the chorionic villi with the cervical mucosa.

(5) There was an elevated decidual formation to be felt in the cervical canal, in the right side of which was the location of the placentar attachment.

(6) The cavum uteri was perfectly empty and smooth.

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Treatment of Asphyxia by Traction upon the Tongue.

Laborde (*Abeille Médical*, 1893, No. 3) believes that asphyxia is to be combated by strong rhythmical traction upon the tongue. Apart from the good results in asphyxia of the new-born, Laborde has applied the method with good results in an adult poisoned with bromidia, who was pulseless and without appreciable movement of heart.

The action of this method is referred by Laborde to the primary excitation of the sensitive nerves and transferrence of this excitement to the motor nerves of the respiratory muscles, especially excitement of the nervus laryngeus superior, then the glosso-pharyngeus and lingualis, finally, the phrenic.

Antiseptic Obstetrics.

C. Godson, of London (*Lancet*, April 1, 1893), refers to the improvement in the mortality of his hospital. In the year 1870 the mortality was 4 per cent.; from 1873 to 1883 average yearly mortality over 2 per cent. In the four years from January, 1880, to January, 1884, over 3 per cent. In the last six years, from January, 1887, to January, 1893, the mortality was 0.31 per cent. The ground for this lowering of mortality lay in the thoroughly practised antisepsis. For disinfection of the hands sublimate was used. Every parturient patient received a vaginal douche, 1 : 2000 sublimate, and a second after the termination of the labor. During the puerperal state, for the first six days, a similar douche twice daily; later a douche of permanganate of potash or carbolic acid. Poisoning by absorption of sublimate so used Godson has never observed.

Intra-Uterine Infection of the Fetal Lungs.

M. Legry (*Bulletin de la Société Anatomie de Paris*, December, 1893) exhibited the lungs of a child which had lived but ten hours, and had suffered from insufficient respiration. The pleura showed fibrinous deposits and false membranes. In the pleural cavities was about a half coffeespoonful of sero-sanguineous fluid. The examination of the membrane and the fluid showed the presence of streptococci chains. The mother had been well during her pregnancy. Only in the last month she had had a strongly irritant white discharge, which had occasioned a violent vaginitis. The membranes had ruptured three days *ante partum*, from which Legry believed that there had been an ascending infection of the child. The result of the examination of the vaginal section was not at the time of writing ready for report.

A Rare Lesion Causing the Death of a New-Born Child.

Negri, of Venedig (*Annali di Ostetrica e Ginecologica*, 1893, No. 4), refers to a case in which a child weighing 3490 grammes and 51 centimetres long was extracted by forceps asphyxiated, but was easily resuscitated by immersion in a hot bath. Two days later, in absolute appearance of health, it suddenly grew pale and died. The autopsy revealed a bursted liver hematoma as cause of death.

Negri believes that the cause of the hematoma was the increased tension of the abdomen from the asphyxia. In this case there was no swinging of the child, and it was not clothed, but had been removed from the warm bath and loosely covered.

The case is certainly a proof that the swinging by Schultze's method is not always to be regarded as the cause of hematoma of the liver.

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Identical Bacteria Found in Two Cases of Melena Neonatorum.

Gärtner (*Archiv für Gynäkologie*, Band XLV, Heft 2) refers to the fact that the etiology of melena neonatorum is based upon manifold hypotheses. Rehn and Neumann have referred to a bacteriological cause. Gärtner observed two cases, and was able to identify a bacillus with the cause of the condition. The bacillus has the following peculiarities: The temperature required for its growth is that of the blood. The motion in hanging-drops is peculiar and lively, the bacillus turning about its transverse axis. The multiplication is by division. In agar, and especially in gelatin, it shows characteristic culture forms and the formation of gas. It is, during the disease, found in the intestinal contents and in the blood, and by section in the liver and spleen. The intestinal hemorrhages are to be regarded as the consequence of the wandering of the bacilli through the walls of the gut from the serosa, and thereby the destruction of the glandular layer. The petechia upon the serous coat of the intestine and the peritoneum, the lesser and greater hemorrhages found in the liver and the spleen, are caused by the stopping of a vessel from the large numbers of melena bacilli. The resemblance of the condition on section between animals inoculated with melena and by melena neonatorum is identical.

The best results in the inoculation of animals were afforded by the infection of new-born animals through the umbilical cord, or by intraperitoneal injection. Also in human beings, the entrance portal is the umbilicus. All investigations of fresh cases have shown that at first there is peritonitis, following this the infection of the intestines. The bleeding and infection of the rest of the body follow.

A Case of Spontaneous Intra-Uterine Rupture of the Umbilical Cord.

Funcke, assistant to the obstetrical Clinic of Freund, in Strasburg (*Centralblatt für Gynäkologie*, No. 31, 1894), reports the following case occurring in the clinic: Patient, a II-para, was admitted to the house five hours after the spontaneous rupture of the membranes, and had passed abnormal quantities of amniotic liquor. The movements of the child at the time of admission were plainly perceptible, as were also the heart sounds, 128 to the minute. The portio was high above the promontory, and with difficulty reached. The external os was closed. Nine hours later the heart sounds were weak, ninety to the minute. During this time, especially in the last three hours, there had been weak pains, and the mother had felt the motion of the child. Three hours later the fetal heart sounds were no longer to be recognized. About eight hours later the patient rose to urinate, and during the act a long cord fell from the vagina, which was recognized as the umbilical cord by the vessels in its torn end. The piece of cord hanging from the vagina was twenty-five centimetres long. By vaginal examination, the cervix was found about one centimetre long, and the cervical canal just admitted one finger. The breech was found presenting. The torn, prolapsed cord was cut off at the inner os in order to prevent sloughing in case of prolonged labor.

After administering a hot bath weak pains were experienced, and some dark blood was expelled from the vagina. The dilatation of the os was accomplished with a colpeurynter, and after a slow labor the child was delivered. The child was dead, weighed 1000 grammes, forty-eight centimetres long, and smelt slightly. The placenta was expelled a half hour after. The umbilical cord had been torn directly from the abdominal insertion in the fetus without opening the abdominal cavity. There was no blood in the peritoneal cavity of the fetus. To the placenta

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was attached a piece of cord fifteen centimetres long, making the entire length of the cord forty-eight centimetres. The cord was fresh, without maceration or torsion or other injuries.

Funcke refers the rupture of the cord possibly to spontaneous intra-uterine rupture in closed or slightly dilated cervix during the first period of labor.

A Method of Extracting the After-Coming Head not Previously Described.

J. Pulvermacher, of Breslau (*Centralblatt für Gynäkologie*, No. 29, 1894), refers to the fact that in many cases the head of the child is found in such position that the occiput, resting partly or wholly upon the pelvic wall, is bent at an angle to the neck, and that the hand can only feel an ear and the presenting part of the cheek or the zygoma. The other parts of the face, forehead, eyes, nose, mouth, and chin cannot be felt. The known methods partly cannot be applied, and do not bring about the desired results. In such cases, Pulvermacher applies the following procedure:

A dull double hook is guided by the hand to the region of the zygoma, somewhat beneath the infra-orbital margin, and the blunt end of the instrument, which is hook-shaped, is with the hand in the vagina firmly pressed against the head, while on the other hook-shaped end, which projects from the genitals, a firm traction is made by the other hand. The nurse makes traction during this time with one hand on the legs of the child directing it downward, and presses with the other hand through the abdominal walls upon the head. The face turns immediately towards the sacral hollow, and the child's head will rapidly be delivered.

The part of the face upon which the hook has pressed shows no injury, hardly an abrasion of the skin.

Pulvermacher recommends this methed in cases where the head is in the above-described position.

GYNECOLOGY.

UNDER THE CHARGE OF

WILLIAM GOODELL, M.D., AND CHARLES BINGHAM PENROSE, M.D.,

ASSISTED BY

WILLIAM A. CAREY, M.D., AND H. D. BEYEA, M.D.

Acute Endometritis.

The future advances in the treatment of pelvic inflammatory diseases must be in the direction of prophylaxis. All such diseases originate in an acute endometritis. Labors and abortion, followed by a distinct rise of pulse and temperature, together with fetid discharges, must be treated first by intra-uterine antiseptic irrigations, to be followed in half a dozen hours, if not cured, by the free use of the sharp curette, antiseptic irrigations, and iodoform-gauze packings. Gonorrheal endometritis should be treated at once by the sharp curette, antiseptic irrigations, and gauze packing. Anything short of this is unwarranted procrastination. [Abstract of paper read by Dr. J. M. Baldy at the recent meeting of the Pennsylvania State Medical Society.]

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Ligation of the Base of the Broad Ligaments per Vaginam for Uterine Fibroids.

Goelet (*American Medico-Surgical Bulletin*, June 1, 1894) states that this operation has given very satisfactory results in controlling uterine hemorrhage and diminishing the size of the fibroid growths. He prefers this operation to hysterectomy when the major operation is likely to be attended with any considerable risk. It is also appropriate as a preliminary measure, with a view to obviating the necessity for the more radical operation. He has observed marked decrease in the size of some tumors after this operation, particularly in those cases where no extensive and vascular adhesions are present. The author's method of operating consists not only in the ligation of the uterine artery on each side on a level with the internal os, but also in the introduction of a second or a third ligature in such a position that the uterine artery will be encircled by each ligature as it ascends along the cervix. This results in the cutting off of the compensating blood-supply from the ovarian artery to the lower part of the uterus. The credit of priority is given to Martin, of Chicago, although Goelet states that in January, 1889, he ligated the uterine artery on one side of the uterus *per vaginam*, in a case of a large fibroid (size of seven months' pregnancy) with adhesions, in the hope that the size of the tumor might be diminished. Six months after this operation he was pleased to note that the tumor was two-thirds its original size and was giving no inconvenience.

The Abuse of Trachelorrhaphy.

William R. Pryor (*American Journal of the Medical Sciences*, June, 1894) believes that the operation of trachelorrhaphy is commonly misapplied. The procedure should be limited, in the author's opinion, to the immediate operation for hemorrhage and to those cases of tear through the cervix from internal os out to the vaginal junction, cases of true extraperitoneal rupture of the uterus. Slight lacerations, it is claimed, are not productive of erosions, cervical hypertrophy, cystic degeneration, sterility, and subinvolution, nor of "reflex symptoms," except to a very limited degree. Indeed, lacerations of moderate length are said to be beneficial, and the author "can but believe that Nature has intended this lesion as a safeguard." Unless there were a certain amount of tearing of the cervix (which has the sphincter function of the uterus) there would be danger of a retention of the afterbirth or lochial discharge. It is feared that in case of no laceration the normal elasticity of the cervical tissues would be so quickly regained and the contraction of the cervix after delivery would be so rapid that sufficient time for drainage would not be given, and that, therefore, the tear is of special importance. "When our modern woman so far advances that she will cease to discharge her placenta, that she will cease to have a lochial discharge, she may have all tears in her cervix united. Until that time arrives, she has need for a lacerated cervix; it is essential to her safety."

Probably the most frequent cause for the operation of trachelorrhaphy is subinvolution. The author contends that such a condition is not the result of a tear in the cervix, but is due to the injury which is sustained by the uterus in a protracted labor.

Cystic degeneration of the cervix should not be treated by puncturing the cysts and uniting the torn surface of the cervix, because of the probability of epithelioma developing in such tissue. Thorough removal of all such tissue should be performed.

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The author states that during the past twelve years the operation of trachelorrhaphy has been performed more frequently than ever before, and often as a preventive measure against the development of cancer, and yet he finds cancer of the uterus on the increase. Laceration of the cervix is not held responsible for cancer, but rather the sudden onsets of developmental activity and equally sharp retrograde processes. Not by seeking for its local causes can we expect to check it, but by a critical study of every condition under which the disease occurs may we hope to arrest its inheritable tendencies. Women who have by heredity any tendency to cancer should remain sterile, inasmuch as repeated childbirths more than anything else conduce to it and disseminate it. "If we operate to *prevent* the possible occurrence of cancer in those who may reasonably expect it, assuredly trachelorrhaphy is not indicated, but a more radical procedure which will remove the entire cervix."

A pathological laceration of the cervix requiring trachelorrhaphy the author defines as any tear which is of sufficient severity and degree to implicate the circular fibres of the cervix sufficiently to cause a modification in shape or position of the uterus. A tear to do this must sever most of the sphincter fibres of the cervix at one or more points. The lesions found associated with a lacerated cervix are best treated by either a curettage of the uterus or by some form of amputation of the cervix which provides for the maintenance of a cervical mucous membrane. The great objections which the author urges against trachelorrhaphy are that it does not give a cervical canal of dimensions equal to the requirements of a woman who should continue to bear children with increasing ease as years pass by; it does not remove sufficient tissue when the operation is indicated, and it does not appear to him as a rational procedure, because he believes that most of the cases subjected to it require no operation on the cervix, inasmuch as a generous laceration is normal and necessary.

The Technique of Suprapubic Hysterectomy.

Joseph Eastman (*American Journal of Obstetrics*, May, 1894) states that during the last four years he has been trying to reduce the number of ligatures to the minimum. He presented a specimen to the Marion County Medical Society recently, which, with the exception of the ligatures used in tying off ovaries and tubes, was removed without any ligature at all; the uterine arteries, being left with the woman, were neither tied nor cut, and cannot be seen on the tumor. The necessity for ligating vessels is overcome by separating the tumor from its capsule and then uniting the flaps of the capsule. For this purpose the author devised an instrument with serrated edges, somewhat resembling a Simon's spoon. After opening the abdomen and tying off the broad ligaments sufficiently to secure the ovarian arteries, the tumor is girdled by button-pointed scissors below the place where the elastic ligature is usually placed, drawing up the capsule anteriorly and posteriorly. The instrument, described above, is then employed to peel down the capsule of tumor and cervix, as a glove finger would be pushed down and off with a spatula. The hysterectomy staff is then introduced into the vagina, and the vaginal tissues are punctured into the groove of the staff, and through this opening is passed a strip of dermatal gauze, which is drawn down into the vagina to act as drainage. The upper end of gauze is packed into the pocket, and the flaps of the capsule are folded and united with silkworm gut so as to secure sero-serous approximation with drainage from the vagina.

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PATHOLOGY.

UNDER THE CHARGE OF

JOHN GUITÉRAS, M.D.,

ASSISTED BY

JOSEPH McFARLAND, M.D

THE OCCURRENCE OF EOSINOPHILE CELLS IN HUMAN BLOOD.

ZAPPERT (*Zeitschrift für klinische Medicin*, Bd. XXIII, Heft 3 und 4) made a large number of studies of human blood to discover the occurrence of the eosinophile cells in health and disease.

He found that in afebrile pulmonary tuberculosis there was a frequent diminution of the eosinophile cells. In a number of skin-diseases their number was considerably increased. In most febrile conditions, during the pyrexia, a diminution of the eosinophile cells was observed, which soon returned to the normal when the fever subsided.

Injections of tuberculin with marked reaction caused a diminution during the febrile stage, an increase in the number of eosinophile leucocytes.

A NOTE ON A NEW METHOD OF PREPARING CULTURE MEDIA.

SMITH (*British Medical Journal*, June 21, 1894) speaks of the difficulties in the way of preparing artificial culture media that will approximate the juices and tissues of the human body, and suggests their preparation on the principle discovered by Lieberkühn, that the addition of potash to white of egg would give a very solid and insoluble proteid substance in the form of solid, insoluble, clear jelly. Lieberkühn also pointed out that if this be washed till the free alkali is completely removed, it has a neutral reaction to litmus.

The method suggested by Smith is as follows: "Add to ox cerum 0.1 per cent. to 0.15 per cent. caustic soda, and heat the solution to 120° C. in the autoclave, when the desired jelly will be obtained.

"In the case of the hen's egg the following method has been found reliable: Break up the white with an egg-beater till it loses its consistency. Add to it 40 per cent. of water, and mix well. Pass the mixture through a muslin to remove any shreds of insoluble material, or let it stand over night in a cylinder till these settle to the bottom. Add 0.1 per cent. caustic soda, and solidify in the autoclave. Egg-white is naturally more free from pigment than serum, and with a little care in clearing it a jelly can be obtained closely resembling gelatin in transparency. Substances like glucose may be added as desired.

THE GONOCOCCUS OF NEISSER: ITS OCCURRENCE IN URETHRITIS AND BARTHOLINITIS.

CARL HASSE (*Inaugural Dissertation*, Strasburg, 1893), after many experiments, gives the following as the best method of staining the gonococcus.

(1) The prepared cover-glass is drawn but once through the flame.

(2) Stain thirty seconds in a saturated solution of methylene-blue in 5-per-cent. solution of permanganate of potassium.

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(3) Wash off in water and decolorize in suitable weak solution of acetic acid until the blue color disappears and is replaced by violet.

(4) Wash out the acid in water.

(5) Stain in picro-carmine until a rose color occurs, when the specimen is held over white. This generally occurs in five to eight minutes; if not, the specimen may be warmed.

(6) Wash in water for a minute.

(7) Dry and examine in glycerin or Canada-balsam. The cocci appear blue, the nuclei of the cells red, the protoplasm light blue, while that of the epithelial cells appears a trifle yellowish.

Hasse studied the urethral and Bartholinic secretions of 625 cases, and found in nineteen cases bacilli only, in twenty-seven cases cocci alone, and in 147 both together. In the secretions of the Bartholini glands he found cocci and bacilli constantly together. In general, it may be stated that in acute gonorrhea no other bacteria than the gonococci were to be seen, but that with the disappearance of the gonococci and the increase in the epithelium, other bacteria, both cocci and bacilli, occurred in great numbers.

ON VACUOLATION OF THE NERVE-CELL OF THE HUMAN CEREBRAL CORTEX.

ALFRED W. CAMPBELL (*Journal of Pathology and Bacteriology*, February 1894, Vol. II, No. 3, p. 380) has collected and tabulated the various cases in which vacuolation of the nerve-cells was found. The conclusion reached as the result of the research is *that vacuolation of the nerve-cells of the cortex cerebri is in all cases induced by a toxemic condition.*

He found that vacuoles may form either (1) in the nucleus, or (2) in the surrounding granular protoplasm of the cell body, or in both together. Vacuolation of the cortex alone is most frequent in the superficial layers.

(1) *Vacuolation of the Nucleus.*—The initial visible alteration is a slight uniform swelling of the whole of the nucleus, accompanied by an alteration in its normal reaction to the staining material. Subsequently to these alterations one or more minute, circular, clearly-refractive, oily droplets form, either in the nucleolus or in the other altered portion of the nucleus; these multiply, enlarge, and may coalesce, until finally the whole nucleus is converted into one large cavity filled with lustrous oily material. At a later stage the envelope bursts, allowing the contents to escape and a well-defined non-lustrous vacuole is left.

(2) Vacuolation of the surrounding protoplasm is more frequently observed in the more deeply-situated and larger cell,—namely, those of the large pyramidal and multipolar cells.

The process of formation is similar to that in the nucleus. In the cells in which protoplasmic vacuolation occurs, the adjoining protoplasm is almost always seen to be in a condition of granular degeneration. Pigmentary degeneration often coexists; the number of cell processes is not uncommonly diminished; and in the altered outline of the cell one can often distinguish the rent through which the oily material which formerly filled the vacuole has escaped.

There is one change the existence of which the writer has observed with the greatest constancy and regularity in the cases which he examined,—namely, fatty degeneration of the fusiform muscle nuclei and of the non-striped muscle fibres of the small vessels supplying the cortex and distributed throughout it.

Vacuolation of cortical nerve-cells have been observed in the following diseases: Epilepsy; diseases produced by metallic poisoning, such as arsenic, phos-

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phorous, etc.; chronic insanity; dementia and senile cerebral atrophy; in chronic pulmonary affections; and in acute infective fevers.

In the concluding summary the probabilities in favor of the toxic theory of the vacuolation are given as follows:

(1) I have shown that in all the conditions in which vacuolation has hitherto been described as occurring, there is such a poison at the root of the disease. Epilepsy (idiopathic) cannot be excluded from this class.

(2) I have demonstrated the existence of vacuolation in *phthisis pulmonalis* and acute lobar pneumonia, and in cases of certain acute infective fevers, these being all instances of toxemic diseases.

(3) I have proved that vacuolation of the cortical cell is almost invariably associated with acute vascular degeneration.

(4) I have pointed out that vacuolation of the nerve-cell is probably an acute fatty change, analogous to that occurring in the cells of other organs, in the case of individuals dying of toxemic diseases.

Appended to the paper there is a table of the microscopical examination, etc., of the cases of phthisis, pneumonia, and infective conditions, upon which these observations are based.

DERMATOLOGY.

UNDER THE CHARGE OF

LOUIS A. DUHRING, M.D.,

ASSISTED BY

M. B. HARTZELL, M.D.

Concerning the Etiology of Eczema.

A. Ravogli (*Medical News*, January 13, 1894) regards eczema as entirely distinct from dermatitis, due to varied local causes. He would emphasize the observation that dermatitis is not eczema, although dermatitis may produce eczema. Both affections are based upon an inflammatory process. Experiments made upon rabbits with a pure culture of the staphylococcus pyogenes albus went to show that this microbe was a cause of eczema, its development under the epidermis producing the disease. But a fertile soil for its development is necessary, which is often wanting. The contagiousness of eczema is entirely dependent upon the condition of the epidermis. "Scratching scatters the staphylococci about the skin and prepares the epidermis for their culture."

Dr. Ravogli concludes his article by stating that eczema is a local affection of the epidermis of a chronic inflammatory character, contagious under favorable circumstances; and that it is caused by pyogenic micro-organisms (staphylococcus pyogenes albus) developed upon a previous inflammation of the skin. [The abstractor cannot regard the conclusions, drawn from the experiments, as warranted. There remains much to be proved, clinically and experimentally, before the contagiousness of the disease can be accepted. There is a difference between the contagiousness of a secretion or fluid, as found upon the surface of the skin after the disease has existed for some time, and the contagiousness of the disease *per se*,—that is, independent of adventitious microbes.]

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The Employment of Optical Methods in the Clinical Study of Cutaneous Eruptions.

Broca recommends (*La Presse Médicale*, July 7, 1894) the employment of photography or, as more practicable, blue light in the study of various cutaneous eruptions. By the elimination of the red rays of the spectrum greater differentiation is obtained, and in this manner features not visible to the naked eye become apparent.

Lupus Erythematosus Associated with Suppurating Cervical Glands; Presence of Tubercle Bacilli in the Pus.

At the *séance* held June 14, 1894, of the Société Française de Dermatologie et de Syphiligraphie, Leredde (*Annales de Dermatologie et de Syphiligraphie*, No 6, 1894) presented a woman, 67 years old, the subject of an erythematous lupus of the face of seven or eight years' duration, associated with suppuration of the cervical lymphatic glands. The softened glands were punctured with a sterilized syringe, and the pus thus obtained was stained according to the methods of Zielh and Kühne; great numbers of tubercle bacilli were found.

The Treatment of Furunculosis.

Van Hoorn (*Monatshefte für praktische Dermatologie*, Bd. xix, No. 1), convinced that infection in furuncle takes place from the outside, employs a method of treatment based upon general disinfection of the skin as well as isolation and disinfection of the disease foci. This method is as follows:

The entire skin is cleansed in a warm bath with soft soap, and the furuncle and the parts around it washed with a 1:1000 solution of corrosive sublimate. After drying, the furuncle is covered with mercury and carbolic acid plaster-mull, and the patient puts on clean linen. Every day or, preferably, twice a day, a new plaster is applied, and where perforation has occurred the furuncle is lightly pressed out and disinfected anew with sublimate solution.

The results of this treatment are said by the author to be brilliant, and, what is especially important, new lesions are seldom observed.

The Relation of Eczema to the Mucous Membranes.

Von Sehlen calls attention (*Monatshefte für praktische Dermatologie*, Bd. xix, No. 1) to the relation which exists between eczema of the skin and certain diseases of the adjoining mucous membranes. Inflammation of the nasal mucous membrane, chronic catarrh of the external ear, conjunctivitis, balanitis, inflammation of the anal mucous membrane with the formation of fissures, are some of the affections which may arise from the extension of an eczema. In the treatment of these the author has found ichthyol of great service. The paper concludes as follows:

(1) Chronic eczema of the skin may attack the adjoining mucous membranes, and produce upon them apparently independent affections.

(2) Eczema of the lips, catarrh of the external ear, eczema of the lids, and a certain form of conjunctivitis are to be regarded as special localizations of the eczematous process, and are to be treated accordingly.

(3) Certain inflammatory conditions of the anal mucous membrane, and of the genitalia in both sexes seem to stand in close, if not causal, relationship to eczema of the skin.

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MISCELLANEOUS.

DEATH OF PROFESSOR HELMHOLTZ.

PROFESSOR HERMANN LUDWIG FERDINAND VON HELMHOLTZ, the celebrated physiologist and physician, died on September 8, 1894, from apoplexy. He was born in Potsdam, August 31, 1821. The works of Helmholtz have reference principally to the physiological conditions of the impressions of the senses. After studying medicine in the Military Institute at Bertin, and being attached for a time to the staff of one of the public hospitals there, he returned to his native town as an army surgeon. In 1848 he was appointed Professor of Anatomy in the Academy of Fine Arts at Berlin; in 1855, Professor of Physiology at Königsberg, whence he removed, in 1858, to Heidelberg, where he also filled the Chair of Physiology. He was appointed Professor of Physiology at Berlin in 1871, and in October, 1877, was installed as Rector of the University of that city.

His first great production was a treatise "On the Conservation of Force," which was published in 1847, and set forth, clearly and indisputably, for the first time, the interchangeability and indestructibility of all the manifestations of force in nature, such as light, heat, electricity, chemical action, and animal vitality.

His investigations of the phenomena of light led to the discovery of the reason why the pupil of the eye appears black, and why we cannot, without mechanical agency, see into the interior of the eye. This course of investigation led him, in 1851, to the invention of the *ophthalmoscope*.

His further researches in the field of optics resulted in the publication, between 1856 and 1867, of several exhaustive works on the subject, in which he established the so-called empirical theory of vision, and included the whole range of optics, from the investigation of the limits of human power of perception to that of the details of vision, and the analysis, combination, and appreciation of colors. In 1862, the versatility of Helmholtz was further shown by the publication of a work on "Sensations of Tone, as a Physiological Basis for the Theory of Music," in which he threw the light of natural science upon the fundamental principles of music and esthetics.

In 1870 he was admitted to foreign membership in the French Academy of Sciences, a prominent member of which body, on the occasion of his election, characterized him as "the foremost and greatest naturalist of the age," and adding that "nothing is wanting to his glory, but he is wanting to ours." In 1883 Dr. Helmholtz was raised

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to the rank of noble by Emperor William I, in recognition of the fame he had brought to Germany. During the World's Fair, Dr. Helmholtz visited this country to attend the Electrical Congress held at Chicago.

CORRESPONDENCE.

VAGINAL HYSTERECTOMY WITHOUT CLAMPS OR LIGATURES.

Editors of UNIVERSITY MEDICAL MAGAZINE:

GENTLEMEN: A paper by the above title was read before the Missouri Valley Medical Society, March 15, 1894, describing a method of bloodless enucleation of the uterus similar to the first method described by Pratt.

The operation consists in incising the mucous membrane surrounding the os, the incision completely encircling the cervix. The tissues are then separated by the ends of blunt scissors, clipping fibres here and there where too firmly attached to be freely torn through. "As little cutting as possible should be done, the prime object of the operation being to enucleate the uterus by suturing the loose tissue surrounding it, the tissue in which the terminal branches of the uterine artery ramify; and by careful work to denude the uterus of its areolar tissue, pressing aside every important blood-vessel uninjured. The only points where separation cannot be quickly done are at the internal os, where the connective tissue is quite dense, along the sides of the organ, and at the entrance of the Fallopian tubes."

This method appears to have nothing to commend its preference to that by ligature except the fact that the peritoneal cavity is not opened and the blood-vessels are not wounded. It would seem that the peeling of a uterus by blunt dissection from its enveloping peritoneal coat and from the areolar tissue at its sides, in which the large blood-vessels ramify, without puncturing the peritoneum or wounding the blood-vessels, would constitute a much more delicate and tedious operation than the application of from four to six ligatures to the broad ligaments. I do not believe that this classic enucleation without leaving uterine tissue behind is, in the great majority of cases, possible. The writer of the paper admits that in only one of the cases upon which his paper was based the operation was bloodless and no ligatures were employed. Should there exist any reason for removing the ovaries and tubes, the writer states, the peritoneum may be cut

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when the operator is ready to sever the tubal attachment. The importance of the removal of the adnexa seems not to have been properly estimated. The especial indication for vaginal hysterectomy is incipient cancer. The uterus and its appendages should then be removed as thoroughly as the condition will permit. The leaving of ovaries and tubes under these circumstances is fraught with extreme danger of the early return of the growth.

This method the writer advocates for the removal of small intramural fibroids, procidentia, and for early cancer of the cervix. I do not believe that small intra-mural fibroids are indications for hysterectomy. Should the fibroid tumor be of such small size that it can be safely removed through the vagina, the proper operation would be either that of myomectomy, by which a uterus, capable of performing its function, will be left the patient, or oöphorectomy, which is a simpler operation, of shorter duration, attended with less risk to the patient and less mutilation. I also do not agree that the uterus should be removed for procidentia, especially if the woman be still in the child-bearing period, any more than we would agree that the arm should be amputated for luxation.

In early cancer of the cervix it is the method and not the operation that we would criticise. The teaching of surgery has been and still is that carcinomatous growths should be removed freely, with as much surrounding tissue as will insure their complete removal. Who would enucleate a cancerous nodule from the breast? The operator who would leave connective tissue from the sides of the uterus, peri-uterine, peritoneum, and Fallopian tubes, which are prolongations of uterine tissue, in a case of cancer, for the reason that the operation is less difficult and the hemorrhage is less, is not giving his patient the best prospect of a cure. I could sanction no method that did not freely extirpate the uterus, tubes, and ovaries.

At our present age there is an unfortunate tendency to devise methods and to improvise departures from the regular methods in order that operators may step prominently before the profession. This is unfortunate, because by the practical application of many such departures, conceived in theory, the laity suffer. Our previous methods of performing vaginal hysterectomy by the ligature, in which the uterus, ovaries, and tubes are removed entirely, the stumps of the ligaments drawn into the vagina and the wound in the vaginal vault closed by suture, is so perfect a surgical procedure, and its mortality in the hands of skilful operators has been so small, and the convalescence so rapid as to leave no excuse for a less surgical procedure.

FRANK W. TALLEY, M.D.

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BOOK NOTICES.

CLINICAL DIAGNOSIS. By ALBERT ABRAMS, M.D., Professor of Pathology, etc., Cooper Medical College, San Francisco, Cal. Third edition, revised and enlarged. Illustrated. New York: E. B. Treat, 1894.

The fact that two editions of this book have already been exhausted is sufficient proof of its favorable reception. The work consists, for the most part, of well arranged selections from the best authorities on clinical diagnosis. In the present edition the author has added many synoptic tables, a chapter on insanity, and a summary of recent methods of diagnosis. There are some statements to which but few clinicians would be willing to subscribe,—namely, that unilateral dilatation of the chest is observed in croupous pneumonia, and the following, referring to the method of distinguishing between pneumonia and pleurisy in children: "It is not infrequent, especially in children, that a pleuritic effusion may yield the same physical signs as a pneumonia, in which case a differentiation may be necessary without having recourse to the exploratory needle. If the upper line of dulness is marked and then an hypodermic injection of pilocarpine is given, the line of dulness on percussion will be lower after than before the injection." Notwithstanding a few inaccuracies, the work contains a vast amount of valuable material, which has been carefully classified, and condensed within a small compass.

BIOGRAPHY OF EMINENT PHYSICIANS AND SURGEONS. Illustrated with Photo-engraved portraits. Edited by R. FRENCH STONE, M.D., Author of "Elements of Modern Medicine," Surgeon-General National Guard, State of Indiana, etc.

It has been eighteen years since the last work of this kind appeared under the title of "Physicians and Surgeons of the United States." This is not only out of print, but even if this were not the case, almost a new generation of physicians has come to the front since that time, so that the necessity of rewriting American Medical Biography has resulted in the present volume. Every physician must be interested in familiarizing himself with the histories of distinguished men in the profession. And yet few have time to seach out the dusty biographies from the shelves of the library and plod through long pages of minutiæ. The value of having the pith of such works extracted and put in a form available to all will be appreciated by a large number of the profession. Dr. Stone has confined his work entirely to members of the regular profession, and while it is not as complete as could be desired, still this defect is not due to any lack of energy on the part of the editor, to whom much credit is due for the painstaking care in its compilation.

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The work begins with an introductory chapter containing an outline review of the progress and condition of medical science and medical practice from an early period in our country's history to the present time. The biographies occupy upwards of 700 pages. There is an index of portraits and of names arranged alphabetically and also according to cities and towns.

ANTISEPTIC THERAPEUTICS. By Dr. E. L.. TROUESSART, Paris, France. Translated by E. P. HURD, M.D. Two volumes. Detroit: George S. Davis, 1893.

These two small volumes belong to the series known as the Physicians' Leisure Library. In the first volume are considered systematically the various drugs which are employed as antiseptics, and in the second volume is discussed the antiseptic treatment of disease. All the important advances made in this department of therapeutics have been included. In view of the increasing prominence given to antiseptics in medicine, surgery, and obstetrics this work ought to have an extended circulation.

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NOVEMBER, 1894.

THE INFLUENCE OF THE HABITUAL INCLINATION OF THE PELVIS IN THE ERECT POSTURE UPON THE SHAPE AND SIZE OF THE PELVIC CANAL.

By Barton Cooke Hirst, M.D.,
Professor of Obstetrics in the University of Pennsylvania.

From the last quarter of the eighteenth century, when Müller first called attention to it, the inclination of the pelvis received much attention from obstetricians, until the observations of Naegele, Weber, and Meyer showed how the pelvic obliquity varied greatly, not only in different postures, but even in the erect posture, under the influence of abduction, adduction, and rotation of the thighs. Thus, in a single individual, the pelvic obliquity, normally about 45°, can be practically obliterated in a squatting posture or can be increased to 100° by strong abduction and rotation of the thighs. Because the pelvic inclination can be decreased or increased at will, it is generally argued that the pelvic obliquity is a negligible quantity in the act of childbirth. While this view is correct, it has led to a general neglect to consider the influence of the habitual inclination of the pelvis in the erect posture upon the development of the pelvic bones and upon the evolution of the pelvic canal.

If there is an exaggerated inclination of the pelvis in childhood, as in rachitis, dislocation of the femora, double club-foot, lordosis, etc., the direction in which the trunk weight is received by the sacrum increases the rotation forward of that bone upon its transverse axis, diminishing the antero-posterior diameter of the inlet and diminishing the depth of the pelvic canal. Further, the exaggerated pull of the rotative muscles of the thigh, put constantly upon the stretch, separates

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the tuberosities of the ischia more widely than common, and thus widens the pelvic outlet.

On the other hand, if the pelvic inclination is much diminished, as in kyphosis from caries of the spine, rachitis, or certain forms of osteomalacia, the top of the sacrum is pushed backward, so that this bone is lengthened and straightened, thus making the antero-posterior diameter of the inlet greater and increasing the depth of the pelvic canal. Further, the pull of the ilio-psoas muscles, put upon the stretch in the erect posture, drags the iliac bones apart, and by a compensatory movement approximates the ischia, thus diminishing the transverse diameter of the pelvic outlet.

The habitual inclination of the pelvis in the erect posture is therefore one of the chief factors in the production of the most important pelvic contractions. Consequently its effect upon the progress of labor should not be ignored. These general propositions are well illustrated by the cases figured in the plate.

Figs. 1, 2, 3, and 4 represent a young woman, aged 19, whose spinal extensor muscles became paralyzed as the result of an attack of measles when she was about 13 years of age. The unopposed pull of the ilio-psoas muscles produced the extreme lordosis that may be seen in the illustrations. The pelvic inlet in this case looked actually downward and the pelvic outlet directly backward. The external measurements were: iliac spines, twenty-two and a half centimetres; iliac crests, twenty-six centimetres; external conjugate, fifteen and a half centimetres; tuberosities of the ischia, ten centimetres (a large measurement compared with the others). The extreme rotation of the pelvis on its transverse axis carried the external genitals with it so that they looked almost directly backward. Coitus in the usual posture would have been impossible. The upper edge of the pubic hair was more than five centimetres above the upper edge of the symphysis, the skin of the lower abdomen being unable to follow the pelvis in its backward movement. No position which this girl could assume would have much diminished the pelvic obliquity, so that, were she in labor, the process would be seriously retarded by the pelvic obliquity itself as well as by the influence of this obliquity upon the development of the pelvis.

Figs. 5, 6, and 7 represent an Italian woman, 25 years of age, who had had three children, all destroyed in labor. She had been in this country about seven years, and all her children had been born here; the first four and a half years ago. The osteomalacia, from which she suffered, had begun after the birth of the first child. In the last four years she has lost more than six inches in height, and now her trunk is so much shortened that the floating ribs are telescoped within the fals

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FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIG. 5.

FIG. 6.

FIG. 7.

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pelvis. The spinal column has bent so far backward in the dorsal region that the same result is produced upon pelvic obliquity and, to a degree, upon pelvic form as though there had been a true kyphosis since childhood. The external pelvic measurements were as follows:

Iliac spines	24½ cm.
Iliac crests	27½ "
Trochanters	29 "
External conjugate	17½ "
Transverse of outlet	9½ "
Ensiform cartilage to symphysis	15½ "
Posterior superior spinous processes of ilia	7 "

The upper edge of the symphysis was a considerable distance above the upper edge of the pubic hair. The anterior wall of the pelvis was sensitive, and the bones yielded to pressure.

The sacrum was twisted on its longitudinal diameter so that the right side of the bone was much more prominent than the left. On an internal examination, the pubic rami were so closely approximated that it was difficult to insert a finger between them. The sacral curve was exaggerated, as in rachitis, but the angulation was more pronounced.

The pelvis, in short, presented a queer combination of the rachitic and the kyphotic types.

I did an oöphorectomy on this patient in the hope of arresting the progress of her disease, but unfortunately she became wildly maniacal after the operation, tossed about in the most violent fashion, and at length pulled the stump on one side from its ligature and bled to death.

It has been repeatedly asserted that deformed pelves are rare in this country, but this assertion, as regards our larger cities, is refuted by my own experience and by that of every one who takes the trouble to observe the pelves in his pregnant and parturient patients.

During the past twelve months I have had under my care, in labor, two rachitic dwarfs, two women with obliquely contracted pelves, some half-dozen cases of rachitic pelvis and a larger number of generally contracted and of simple flat pelves.

A Mutual Dissection Society.

The Société d'Autopsie Mutuelle, founded by Dr. Condereau in 1876, is now presided over by Dr. F. Laborde. The membership is limited to 100. The Society has a museum which contains the brains of several distinguished men, such as Broca (of "Convolution" fame), Bertillon, Fauvelle, Gambetta, and Eugène Véron. We are not aware, however, that the disinterested labors of the Society have as yet added much to our knowledge of the higher nerve-centres.—*British Medical Journal.*

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ANTERIOR POLIOMYELITIS.[1]

By De Forest Willard, M.D.,

Clinical Professor of Orthopedic Surgery in the University of Pennsylvania, Surgeon to the Presbyterian Hospital, etc.

AND

Guy Hinsdale, M.D.,

Physician to Out-Patient Department, Presbyterian Hospital; Assistant Physician to Orthopedic Hospital, etc.,

It is probable that anterior poliomyelitis will be relegated in the near future, in common with many other diseases of the nerve-centres, to the class of infectious diseases of microbic origin.

As yet we have little proof to offer in support of such a proposition, but the surgical pathology of to-day is nothing if not bacterial. One affection after another is analyzed in the laboratories of the world; the organism is finally isolated by the refinement and higher powers of the pathological technique of these last years of the century. In these days we could fill a veritable Pandora's box with the scourges of the universe, the pure cultures would be marked with the names of anthrax and tubercle, relapsing fever and glanders, cholera and typhoid, diphtheria and leprosy, pneumonia and tetanus; with the names of Neisser and Laveran and Pasteur, and with all the toxines and ptomaines in an ever-lengthening list. The plagues that have escaped to the ends of the earth are now collected within the walls of our modern institutes of hygiene.

We have already alluded to the probability of the infectious origin of sclerosis of the spinal cord, and a recent observation indicates the microbic origin of chorea. Dana also infers from his studies of the pathological anatomy of paralysis agitans that its cause is toxic, and he would therefore classify the disease as a "chronic toxic disorder."

With regard to poliomyelitis the evidence as yet is meagre. The disease is being scrutinized with reference to this point, and evidence will no doubt be forthcoming. A very pertinent observation has been recorded by Cordier in a report of thirteen cases of infantile atrophic paralysis. These cases occurred as an epidemic in the months of June and July, 1885, in a district containing fourteen to fifteen hundred inhabitants, affecting children from ten months to two and a half years old. Previously healthy, they were seized with fever of variable degree without premonitory symptoms. Convulsions occurred in half

[1] One of the Mütter Course of Lectures delivered before the College of Physicians of Philadelphia, 1893.

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the cases, but without reference to the gravity of other symptoms. Profuse sweating was noted during the febrile period as a rule, but was absent in four cases that terminated fatally. Paralysis appeared in several cases after the third day in the lower extremities, or in all four at the same time, and in some cases involving the neck muscles. Paralysis did not disappear with equal rapidity in all; it would reappear in summer, and remain stationary in winter. The presumption is reasonable that these cases which presented the symptoms of acute poliomyelitis were of infectious origin; and if such were their origin, the discovery of the microbe might not have been beyond the range of possibility.

Another epidemic of infantile spinal paralysis was recorded in 1891, by Medin,[1] of Stockholm. In five months forty-four cases were observed. In the febrile stage there was somnolence, dyspepsia, occasional vomiting; diarrhea in some cases, constipation in others. Facial monoplegia was observed in three cases; facial paralysis, abducens paralysis, and polyneuritis in others. Heubner regarded these cases as infectious.

In our own country, Dana, Putnam, and Welch stand out boldly as the champions of a newer pathology in nervous disease. They strike down deep underneath the foundations of the old pathology,—the phlogistic conception of nervous diseases,—and replace them with the words toxemia and degeneration.

Inflammation is construed simply as the reaction of the system to a poison or irritant; the irritant is a toxine, and in most cases the product of a microbe. When the irritant consists only of dead cells, as occurs after an aseptic injury, we have a reparative process,—call it inflammation, if you like; but in the other forms the irritation is of a microbic or, perhaps, sometimes diathetic origin. It acts especially upon the blood-vessels, connective tissue, and lymphatics, and it calls into play the defensive cells (phagocytes) and defensive proteids of the body.

There is always a something which sets the organism into an active warfare against the invader.

That is the doctrine which we have received; it is the miner's lamp guiding him as he works in new veins that promise richer treasures than have yet been brought to light. Just now the fundamental principles of inflammation are being studied anew. The theories of Virchow, Cohnheim, and Stricker have been successively held; Grawitz,[2] of Griefswald, and his pupils have taken advanced ground

[1] Centralblatt für klinische medicin, Leipzig.

[2] Recent Progress in Pathology and Bacteriology, Boston Medical and Surgical Journal, February 23, 1893.

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along the line of Stricker's researches. Grawitz gave an extended description of his views at the Twenty-fifth Congress of the German Surgical Association in Berlin, June, 1892, but it is impossible even to review them here. The tendency of all these studies is to attribute all inflammation to poisons generated within the system.

Thus it is not surprising to read that "acute poliomyelitis anterior has been shown to be inflammatory, and primarily a connective tissue and vascular trouble. It is probably of toxic or microbic origin also" (Dana).

Déjerine believes that a review of the facts will show that Duchenne's "acute anterior spinal paralysis," and his "general subacute spinal paralysis" are due in reality to a peripheral neuritis, and, as is usually the case in the latter, "probably dependent on infectious or toxic agents of an undetermined nature."

The most recent studies, as, for instance, those by Williamson,[1] of England, go to show that in adult spinal paralysis there are both central and peripheral lesions. His own efforts to detect micro-organisms have as yet given negative results.

The sudden appearance and the complete extent of the paralysis in some cases of infantile paralysis leaves but little reason to doubt a sudden hemorrhage into the substance of the cord as the immediate cause of the difficulty. In cases of slow development the changes are largely due to the effusion of serum; but in the rapidly-developing cases there is speedy and extensive nerve alteration. These symptoms are largely confined to the motor branches, but the sensory branches are at times also involved. While post-mortems can rarely be obtained at this early part of the disease, yet there seems to be but little doubt that the anterior cornua are the portions chiefly involved. Following this hemorrhage, as a direct result from the presence of a foreign body, inflammation occurs. This may be moderate in extent, or it may be of high degree. The loss of power probably results from a combination of sequelæ, both of the initial hemorrhage and of the subsequent inflammation. There is seldom or ever any suppuration, but sclerotic atrophy of the column is nearly always present.

In a case reported by Nonne, where death occurred two years after an attack, there were decided changes of the anterior horn and column with great reduction in the number of the ganglionic cells; there was also degeneration of the anterior root and peripheral nerves, and degenerative atrophy of the muscles. Nonne describes three forms of poliomyelitis:

(1) A circumscript form, which seems to remain stationary at a certain period of its development.

[1] Medical Chronicle, Manchester, 1893.

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(2) A form in which rapid involvement of the muscles occurs and subsequent tendency towards recovery.

(3) A form of slow but steady progress, with secondary atrophy of the peripheral nerves, with evolution and primary atrophy of the ganglionic cells.

Rokitansky has also called attention, in a report of a case of poliomyelitis, to the trophic changes in the skin and to lesions in the peripheral nerves, as well as in the cord.[1] In the case referred to the cause was a definite poison, carbonic acid gas. Death occurred on the ninth day. The autopsy revealed bilateral pneumonia and edema, interstitial and peritoneal hemorrhages, thrombosis of the left popliteal, crural, and iliac veins, cerebral hyperemia and edema, anterior poliomyelitis, a perineal hyperemia, and edema of the sciatic nerve. The patient had had a continuous fever and wasting of the lower extremities.

Peripheral neuritis, whose relation to anterior poliomyelitis is thus claimed, has been frequently shown to be of toxic origin. Baret[2] has just reported three interesting cases of this affection produced by infection. One was the result of typhoid infection, another one from alcohol, and another from infection of syphilis and erysipelas. This case was just convalescing from the last disease, and his symptoms simulated those of poliomyelitis. There was weakness together with slight wasting, numbness, tingling in the lower extremities, with analgesia of the soles of the feet and enfeeblement of the knee-jerk. Pressure on the muscles gave rise to a disagreeable sensation, while pressure on the nerve-trunks caused severe pain. The muscular sense was preserved. In the upper extremities weakness and wasting were less marked, while paresthesia and anesthesia were pronounced. There was also slight convulsive tremor of the fingers. The knee-jerk became entirely abolished, and the muscular sense in the lower extremities totally lost. A left pleural effusion also occurred. Antisyphilitic treatment was followed by improvement.

Multiple neuritis occurred in a series of nine cases at Hamburg in 1886, and were considered by Eisenlohr, who reported them as of infectious nature. Lowenfield argues, on theoretical grounds, that there is an infectious form of multiple neuritis, and cites three cases in proof.

Rosenheim records a well-observed and accurately-reported case of acute infectious multiple neuritis which terminated fatally in seventeen days.

Infantile paralysis is, however, a disease which is rarely fatal, and post-mortem examinations are not very often made. We are in great

[1] Wiener medicinische Presse, December 29, 1889.
[2] Archives de Méd. et de Pharm. Milit., 1893, No. 7, p. 49.

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need of post-mortem investigations by modern methods in early cases. In the late cases the disease has progressed so far that even gross sections of the cord made at different times under a low-power microscope show the cells of the anterior cornu shrunken, and the original condition replaced by chronic sclerosis.

In lieu of autopsies physiologists have recently been making experimental studies in this direction. Herter, of New York, produced myelitis by shutting off the blood-supply in the cord.

Acute myelitis has also been produced artificially in rabbits by Bourges,[1] who published his successful experiments in this direction. Five days after inoculating the animals with the coccus of erysipelas the myelitis was developed, and after fourteen days death occurred. The myelitic degeneration of the cord was most pronounced in the lumbar region.

Rodger produced muscular atrophy in rabbits by infection with the staphylococci of erysipelas. It was followed by degeneration of the cells and of the anterior horns, although the peripheral nerves remained intact. In the degenerative atrophy of the muscles the fibrous groups split up and gradually disappeared, frequently undergoing fatty degeneration.

[TO BE CONTINUED.]

A PLEA FOR MORE PATIENCE IN THE CARE AND TREATMENT OF INFANTILE REPRODUCTIVE ORGANS IN THE FEMALE, WITH NOTES OF THREE CASES.

By Homer C. Bloom, M.D.,

Instructor of Gynecology in the Philadelphia Polyclinic; Out-door Surgeon to the Gynécéan Hospital.

No more fruitful cause of non-congeniality, unhappiness, and even misery is to be met with than want of development of the female reproductive organs. When we remember the train of symptoms that must necessarily follow in the wake of such a condition, this state of affairs can readily be accounted for.

It is not my intention to enter into the special etiology of this condition, but more especially to deal with the practical application of such means and measures as have been found of greatest value in a number of cases.

Nothing new is to be offered in the way of the treatment of these

[1] Bulletin Médicale, February 22, 1893.

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cases. The same methods, the same means, that are being used every day have been employed; but it is to emphasize the great importance of persistently following for at least two years, if no improvement results, the procedures which will presently be discussed.

In considering, first, the etiological condition which enters into this defective development of the special organs of generation in the female, we are met at its very threshold with the same obscurity that marks so frequently the infantile development of other organs not in any way connected with these.

We may have, and do have, in certain individual cases, a fully-developed uterus with infantile ovaries and appendages, and, *vice versa*, we may have an abnormally small uterus with fully-developed ovaries, etc. With conditions like these to deal with, there are no certain etiological factors which cannot arbitrarily be construed in one way or other. To say that a hypoplasia uteri is a purely congenital condition is at once a contradiction of the well-established laws that an unhealthy systemic state during infancy or childhood retards cell-proliferation or cell-development, and consequently a faulty development of certain organs in which this retardation of cell-development is most manifest.

This proves that there is no certainty as to the special factors which enter into this arrested development. It is clear to any one who studies this condition that it can be due not only to some disturbing or restricting element in embryonic life, but to some malnutrition during infancy and childhood.

In discussing the symptoms, let us first take up the rational symptoms, as given by certain individual cases. It is not the ill-looking, the poorly-developed physique that seeks our aid for this condition in the greater number of cases; but, on the contrary, many of these women have every appearance of a fully-developed organism. If she is a married woman, among the first prominent complaints will be sterility and lack of sexual desire; these, too, she will tell you are the woes of her life. To deny these, is to deny that the desire for offspring is one of the strongest of maternal instincts. No class of patients, as a rule, is so unhappy, so much disappointed with the results of married life, as these unfortunate women who are being and have been denied the rights of maternity. No one can view these cases in a moral and social way without feeling the great responsibility resting upon us in the treatment of them.

In connection with these two most prominent symptoms, she will tell you she has either amenorrhea or severe dysmenorrhea with scanty menstruation; that puberty, as far as menstruation is concerned, has been delayed four or five years beyond the expected time, or is entirely absent. These patients will often complain of flushes about the face

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and head. Frequently they will have, if the menses are absent, periodical pains in the lower part of the abdomen and in the lumbo sacral region, menstrual molimina.

Some of them will complain of mammary irritation at periodical intervals, proving that there is, even in the juvenility of these organs, certain nervous phenomena which have more or less to do with the function of menstruation; and in some cases these very nervous symptoms are the most pronounced of all the manifestations they complain of. Occasionally a case will present itself with a certain amount of leucorrhea. At first, in cases of this kind, we are led to suppose that, probably, it is vaginal in its origin; but, in a number of these cases, if we investigate, we will find it is intra-uterine, a species of endometritis, probably due to a phlegmatic or relaxed condition of the organ dependent upon a lack of normal stimulation, the result of faulty development.

In studying the physical signs of such cases, we are not dealing with cases in which there is an absence of one or more organs dependent upon some other for their normal and physiological functions. It is with the infantile condition of one or more of these organs that we are interested.

Noting first the external genital organ, we find, as a rule, these are normal. The vagina is, as a rule, smaller than normal. In exceptional cases it is fully developed. If it is the uterus that is infantile, and, indeed, in most of the cases it is not only this organ that is smaller, but there seems a faulty development of all the reproductive organs, the cervix is usually pointed, and at once you are struck with the abnormal smallness and conical shape of this part of the uterus; or, in a few cases, you may find the cervix large and the body of the uterus small, or the body and cervix may be of equal size, but all are rudimentary in their development, the uterus being less than one and a half inches in length. There is often an anteflexion either of the cervix or body, or each may be bent one upon the other. The position in the larger number of cases is anterior; but occasionally we meet with a posterior non-developed uterus. We find, as remarked above, a faulty development of the uterus is accompanied by the same condition of the ovaries and tubes. These are very hard to outline without anesthesia. I doubt whether we can map out in most of the cases with any satisfaction the true condition without giving an anesthetic. Upon the diagnosis of the true state of these organs will depend largely the correctness of our views as to the ultimate success or non-success of our treatment. If we have satisfied ourselves that the ovaries and tubes are present, and not excessively atrophic or rudimentary, there is hope of the successful issue of the case.

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Let us not lose sight of the fact that we are dealing with conditions in which all the genital organs are present, through which the conjoint functional activity of the ovaries, tubes, and uterus is necessary to accomplish the physiological process, the beginning of life. With a uterus and its allied organs present with no malformation, so far as *these* individual organs are concerned, except their infantile or non-developed condition, we can feel justified in giving a favorable prognosis in the large percentage of cases, only, however, with the understanding that it will require in most cases a long time.

As remarked before, the methods which we will now study are not new. Having made our diagnosis, and presumably under an anesthetic (this being the only satisfactory way), while your patient is under the anesthetic, introduce through the cervix a dilator, and gradually dilate the canal until you have it sufficiently patulous to readily admit a good-sized sound. At the same time we can make considerable massage, and often *free* some slight adhesions about the tubes and ovaries, making the entire pelvic organs more tolerant for our subsequent treatment and manipulations; for we recognize the fact that these organs are not unlike others in this, that the more they are treated the less suffering is experienced. Indeed, I have been impressed with the great tolerance that many of these cases display during what in other individuals would be treatment unbearable without an anesthetic.

Having accomplished this much at our first visit, and having enjoined on our patient rest in the recumbent posture for twenty-four hours, we allow further treatment to go over for five or six days. At the end of this time a steel sound is introduced into the uterus, first immersing in a half strength of tincture of iodine. This can be done several times at each visit, followed by the introduction of a light pair of dilators, which are gently and continuously dilated for a few minutes.

At the same visit we can make our massage and manipulations of the organs of generation. Always insist upon patients, after these treatments, remaining perfectly quiet for an hour or two; for by this we will often save ourselves trouble, and our patients an attack of uterine colic.

This simple plan of treatment is along those lines where we will find the most practical results, and at the same time be able to give a scientific solution for the results which must surely follow a persistent patient carrying out of the principles we have been studying. To more forcibly present the plea for the long continuance of treatment in these cases, notes of three cases will be given showing the results.

Mrs. R., aged 27; married five years. Sterile, with scanty, irregular, painful menstruation, sometimes absent for three or four months.

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Menstruation lasting twenty-four hours, and only a mere show. Some slight albuminous leucorrhea. Flushes about the head and face. Periodical manifestations of a nervous character, calling as it were for that force which nature had failed to supply the reproductive organs sufficiently with for their normal functional activity. Bowels constipated. Urinary organs normal. General appearance that of perfect health. Sexual congress repugnant.

On physical examination the uterus and, indeed, all the reproductive organs were more or less infantile, the uterus measuring scant two inches.

The treatment before indicated was carried out in every detail; for the first few months the apparent results were anything but encouraging, but by perseverance in six months the uterus had a depth of two inches plus. The menses were now more normal, lasting two days, and her nervous phenomena were becoming less and less. At the end of eighteen months this patient was practically well; and a few weeks since I had the pleasure of being told by her family physician that he had delivered her of a nine-pound boy a few days before.

The second case was that of a young woman, 21 years of age; single. She had never menstruated, and the strongest possible nervous phenomena were present at her periods. Indeed, hers was one of those cases in which the nerve element predominated. Often the only relief this patient had was a vicarious hemorrhage, and when the forces of nature were not sufficient to bring on this hemorrhage other means looking to the depletion of a vascular system overcharged by that physiological process whose function is menstruation had to be resorted to. The physical signs were those of faulty development of all the reproductive organs. The same treatment referred to was diligently and patiently followed for over a year with the successful establishment of the menses, and entire relief from the nervous phenomena which had been so pronounced.

The third and last case is one now under care at the Gynécéan Hospital. This case has been carefully examined by Dr. Charles B. Penrose and Dr. J. M. Baldy, both of whom fully corroborated the juvenility of her reproductive organs.

She is 27 years of age; married five years; sterile. Saw a mere show of menstruation at 18 years of age, but had had menstrual molimina since she was 14 years of age. Since the first appearance or show of her menses, there was no time in which she soiled even so much as one napkin, and frequently she would pass six or eight periods without a show; but at the proper time for the periods she would have the nerve-storm incident to the unfulfilled function. Coitus was revolting to her, with this a desire of maternity, upon her part as well as her

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husband's, foreshadowed impending woe, and she was willing to undergo any treatment which was likely to be instrumental in establishing a normal condition.

Physical examination revealed a small infantile uterus whose length was but one inch. All the other reproductive organs were correspondingly small, and, indeed, the rudimentary condition of her organs was such that, in connection with an absence of any menstruation for nine consecutive months, made the outlook anything but favorable; but with an anxious and willing patient the treatment which we have indicated was adopted and carried out twice each week to the present time, dating over one year.

At first, and for weeks, it was most discouraging, but after the lapse of a few months the successful establishment of a mere show of the menses resulted. Each month proved that progress was being made along these lines. The last report of menstruation dates the fourth day of August of this year, lasting three full days with sufficient flow and normal in every way.

In the presence of Dr. Robert LeConte, assistant surgeon to the out-patient department, the uterus was measured and found to be two and one-half inches deep.

This result, with the others above mentioned, is most encouraging, and shows what can be done under adverse circumstances if the treatment is patiently followed out.

As to the rational therapy of this class of cases there seems to be one that is based upon scientific reasoning, that of cell-therapy.

It is obvious that the increased development following the procedures used in these cases is nothing less than that of the stimulation of cell-metabolism which takes place in the growth and development of any tissue or organ.

It is not the intention of this article to enter into a discussion of cellular therapy, but there seems to be no other rational explanation. With electricity I have had very little experience.

Frenchwomen and the Medical Profession.

According to the *Progrès Médical*, the medical profession does not seem to have much attraction for Frenchwomen. Of 165 female students registered in the Paris Medical Faculty at the beginning of the present academic year, only sixteen were French. On the other hand, of a total of 164 female students in the Faculty of Letters 141 were French. There were seven French female students in the Faculty of Science and three in that of Law.

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THE ASSOCIATION OF A PARTIAL COLOBOMA OF THE MACULAR REGION WITH A SUPER-NUMERARY TOOTH.

By William Campbell Posey,
Philadelphia,
Assistant Surgeon, Wills Eye Hospital; Ophthalmologist to the Norristown Insane Asylum.

Coloboma of this region have not been of rare occurrence, and the literature of ophthalmology contains the description of the clinical appearances of many fully reported cases. Opportunities, however, for their pathological study have been but few, so that explanatory statements regarding their formation must be largely hypothetical, being based upon the consideration of the pathological changes of coloboma occurring elsewhere in the ocular tissues, and of the physiological evolution of the embryonic eye. The coloboma which is cited in this article is of unusual interest on account of the occurrence of a supernumerary incisor. The association of these two anomalous conditions is, I believe, quite unique, the only instance of malformations or anomalies occurring in conjunction with coloboma of the macula which have been reported having been those connected with the bones of the calvarium, the anterior fontanelle remaining patulous in one instance, whilst in another a too early union of the sutures had produced microcephalus. According to the statement of the patient, his mother had a dental anomaly which corresponded exactly with his own, but as she died a short time before he came under observation, an examination to prove the coexistence of the two anomalies in her and the possible transmission of the ocular as well as the dental peculiarity was impossible.

The patient was a man, 25 years old, of good family and personal history. The right eye was normal, and the left, that in which the anomaly occurred, was also unaffected by any pathological change other than the coloboma. After the correction of a slight amount of compound hypermetropic astigmatism vision equalled $\frac{5}{4}$ in both eyes. Corresponding to the colobomatous area in the fundus there was a triangular-shaped positive scotoma in the visual field. The apex of the scotoma embraced part of the fixation-point, and extended up and in to a distance of about ten degrees. The rest of the field was normal.

The colobomatous area, which is well shown in the accompanying chromo-lithograph, was situated two and a half discs' diameters down and out from the disc, and had an oval form with its long axis at an angle of 45°. The ground of the coloboma was of decidedly lighter tint than that of the surrounding fundus. There were two rounded

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masses of pigment lying in the space, the one near the disc being about one third the size of the other. They consisted of blackish pigment, which was stippled here and there with whitish bodies, giving a peculiar "pepper-and-salt" appearance to them. The edges of the pigment-masses were quite regular and sharply cut, and were much denser than their central portion, which presented somewhat of a honeycombed appearance. A few of the finer terminal branches of some of the retinal vessels ran over these masses, whilst some of the larger choroidal vessels and part of the pigment of this layer, which was seen lying in the bottom of the space, were obscured by them. The borders of the coloboma were sharply cut, showing no tendency to blend with the tissues surrounding it, whilst its edges and the uninterrupted course of the retinal vessels passing over it gave evidence that it was not in the slightest degree ectasic.

The sketch gives an excellent idea of the appearance of the accessory tooth. This was placed in the median line somewhat obliquely between two well-developed incisors, and did not project anteriorly or posteriorly to them. It was about half the size of either incisor, but appeared to be fully developed. There were no other anomalous conditions in the body.

In regard to the genesis of coloboma of the macular region, several hypotheses have been advanced. Some investigators view the condition as being a true abnormality, as a lack in the development of the ocular tissues in this particular region. Others, again, believe that the cause must be sought for in some interference to the proper closure of the fetal fissure, which is occasioned by an inflammation of the choroid in that position, whilst others think that this hinderance is due to a localized inflammation on the borders of the cleft. There are certainly well-authenticated instances where coloboma of this region have occurred in eyes in which there were no traces of inflammation, but there are cases in which well-marked choroidal and retinal change place the inflammatory origin of the affection beyond question.

It is a matter of experience that nearly all the ocular changes that can be traced to an intra-uterine source lie either directly below or to the temporal side of the disc, or in a position between these, at various distances and angles from it, whilst congenital pathological areas in the other three quadrants of the eye are but rarely seen.

The explanation of this must be sought for in a consideration of the fetal fissure. This region is prone to inflammation above all other parts of the ocular tissues, in the first place, by reason of the greater quantity of pigment that is found on its borders, and, secondly, by the ready transmission of any pathological process to it by the retinal vessels as they enter the eye at that point. The variety in the location

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of these changes is explained by the external rotation in the globe which occurs during intra-uterine life, whereby the cleft is caused to occupy different angles at different periods of fetal development. By knowing the angle which the cleft occupies at certain months, the position of the inflammatory areas would be of value in indicating the time at which the obstruction to its closure occurred. Thus, coloboma of the macula, being a consequence of the patulency of that part of the fissure that is last to close, must be regarded as being due to a disturbing influence which has operated very late. An instance of coloboma of the iris associated with a similar condition in the macular region has not been recorded as yet, the failure of association of the two conditions being probably due to the fact that coloboma of the former membrane are dependent upon those of the choroid, and occur as the result of some early interference to the closing of the fissure.

The origin of macular coloboma from the fissure is further attested to by their shape, as they are usually triangular with their apices directed towards the disc, and again, by the frequent association of large trunks of the retinal vessels with them, instances having been reported where they were seen to leave the eye through these colobomatous areas. Their color and appearance are dependent upon the number of layers of the ocular tissues that have been affected, and also upon the extent to which they have been involved.

The appearance of the coloboma (Fig. 1) would give the impression that all the coats of the eye had not been involved, choroidal vessels and pigment, and the retinal arteries running partially over it, being quite discernible. The case therefore has been viewed as being an instance of *a partial coloboma of the eye, one in which the pigment layer of the retina was alone disturbed.*

In all cases of this affection where a microscopic examination has been made, the pigment layer has been the one that has been the more usually absent. Pause, indeed, has made a histological examination of a coloboma of the choroid and iris in which all the layers of the retina were present except that one.

The explanation of the frequent involvement of this to the exclusion of the other retinal layers is made easier by the researches of recent observers. Scherl has shown that in birds where there is no vascular system in the interior of the eye, the first deposition of pigment is on the external surface of the proximal layer of the vesicle, whereas in all mammals, where there is an internal system present, the pigment appears first on the internal surface of the proximal layer. This would seem to prove that the pigment is a derivative of the blood, and is dependent upon the presence of a vascular layer. Any interference with the vascular supply would therefore retard or prohibit

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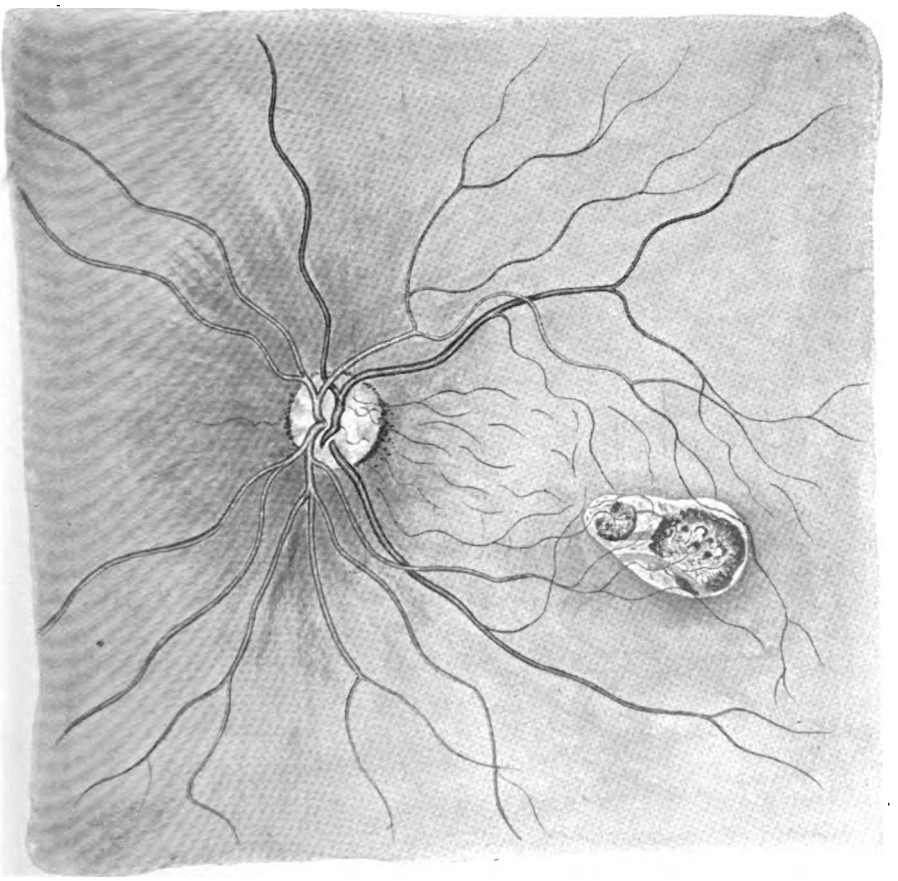

FIG. 1.

FIG. 2.

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its development. In addition to this, Salzman has pointed out that any hinderance to the proper closing of the fetal cleft has a most decided effect upon the pigment layer and its overlying capillaries.

In the case that has been reported in this article, it would seem that there had been some obstacle offered to the proper closure of the cleft, which had disturbed its posterior extremity alone, by operating after the more anterior portion had united. Whether this disturbing factor resided in the vascular system, or whether there was a transmission of the defect from the mother, as suggested by the inheritance of the dental anomaly, it is impossible to say. It is of interest, however, to note a lack of development in one part of the fetal cleft, and an excess in another. It is much to be regretted that an ophthalmoscopic examination of the mother was not possible, as the discovery of the same condition in her, as well as in her son, would have proved that the existence of the two anomalies in the same individual was not accidental, whilst it would also have been strong evidence in favor of the non-inflammatory origin of coloboma of the macular region.

LEUCOCYTOSIS.[1]

By William S. Carter, M.D.,

Assistant Demonstrator of Pathology, University of Pennsylvania; Pathologist to the Children's Hospital.

(CONTINUED FROM PAGE 29.)

The Leucocytosis of Pathological States.

IV. *Leucocytosis from Inflammation of Serous Membranes.*—It is a well-known fact that inflammation of serous membranes are attended with leucocytosis. The nature of the inflammatory process (whether serous, fibrinous, or purulent) does not bear any relation to the degree of leucocytosis. There are certain cases which fail to show any leucocytosis, although there may be an extensive inflammation of a serous membrane. The extent of the inflammation does not determine the degree of leucocytosis. A localized inflammation about the appendix may cause as great a leucocytosis as a general peritonitis.

Dr. R. C. Cabot, of the Massachusetts General Hospital, has recently counted the leucocytes in twenty-four cases of appendicitis. In all except two where pus was found leucocytosis was present, but the

[1] Paper read before the Society for Clinical Research, Philadelphia, May 22, 1894.

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degree of leucocytosis bore no relation to the amount of pus present. In three cases, which at operation proved to be catarrhal, leucocytosis was absent. The two cases with pus, which failed to show leucocytosis, had a general peritonitis, and died within twenty-four hours. These cases did not suffer from pain, and this fact, together with the point that they all showed a feeble systemic reaction, are brought forward to account for the absence of leucocytosis. The absence of leucocytosis in these septic conditions is, probably, an unfavorable prognostic sign just as it is in pneumonia; but there is also another class of cases in which there may be extensive involvement of either the peritoneum, pleura, or meninges, and yet leucocytosis is absent. I refer to *tuberculosis* of these membranes. In these cases leucocytosis is *absent* oftener than it is *present*, if we may judge of the cases reported; and, indeed, when we consider the extent of the tuberculous involvement in some cases which fail to show any leucocytosis, the question arises, Does tuberculosis *per se* ever produce leucocytosis, or is this condition, when present, due to secondary infection by the ordinary pyogenic micro-organisms? Tuberculous appendicitis may be more common than we suspect at present.

The writer has recently had an opportunity to count the blood in two children in the Children's Hospital with tuberculous meningitis.

CASE I.—H. P., aged 6 months; sick eight days; great emaciation; rolling the head; general convulsions; paralysis; bulging fontanelle; high temperature; catarrhal pneumonia. Blood count a few days before death showed red blood-corpuscles, 4,580,000; white blood-corpuscles, 15,600. At the necropsy we found a general acute miliary tuberculosis involving the whole of both lungs, the mediastinal and bronchial glands, the spleen, kidney (right), liver, peritoneum, with one ulcer in the ileum, and some enlargement of the mesenteric glands. There was a very extensive lepto-meningitis. Over the entire under surface of the cerebellum, crura, and all about the circle of Willis, the membrane was greatly thickened, and contained a yellowish inflammatory exudate and vast numbers of tubercles. These were distributed all along the basilar, the posterior and middle cerebral arteries, extending along the latter almost to the great longitudinal fissure. There were also vast numbers of tubercles over the upper surface of the cerebellum and the under surface of the occipital lobes.

CASE II.—R. B., aged 10 months. Had been ill ten days. Seems very sick; considerable temperature; marked retraction of head; characteristic cry; convulsions of right side followed by paralysis; strabismus; Cheyne-Stokes respiration. Blood count two days before death; red blood-corpuscles, 4,800,000; white blood-corpuscles, 9,400. No necropsy allowed.

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Many cases of pleuritis and peritonitis have been reported by different writers which show leucocytosis to be present. Several have stated that the leucocytosis is greatest when the temperature is at its maximum. Although my own observations have been limited in number, they are strictly in accord with the results obtained by Rieder,—*i.e.*, that the leucocytosis seen in inflammations of the serous membranes bears no relation to the body temperature in those conditions.

To determine whether or not an inflammation of the serous membrane which is not bacterial in origin would produce as great a leucocytosis as a specific inflammation of such a part, the following experiments were performed :

EXPERIMENT I.—Healthy young dog ; weighing 11.327 kilos.

Rectal temperature, 40° C., 1 P.M. . . . . R. B. C., 8,250,000
W. B. C., 7,750
1.30 P.M. . . . . R. B. C., 6,650,000
W. B. C., 12,000
2.15 P.M. Injected twelve drops of oil of turpentine into right pleural cavity with sterilized syringe.
2.18 P.M. Is profoundly shocked and cannot stand when untied.
2.25 P.M. . . . . R. B. C., 5,300,000
W. B. C., 15,600
Had several convulsions.
2.45 P.M. . . . . R. B. C., 6,600,000
W. B. C., 12,500
Is still very sick, but is better than he has been.
3.05 P.M. . . . . R. B. C., 6,300,000
W. B. C., 15,600
Seems much easier.
Rectal temperature, 36.7° C., 3.50 P.M. . . . R. B. C., 6,250,000
W. B. C., 50,625
6 P.M. . . . . R. B. C., 6,850,000
W. B. C., 43,750
Gave morphia subcutaneously.
Next day . . . . . R. B. C., 7,500,000
W. B. C., 34,500
Animal bled to death. Right pleural cavity showed an extensive sero-fibrinous inflammation.

EXPERIMENT II.—Rabbit of medium size.

2 P.M. . . . . R. B. C., 6,600,000
W. B. C., 7,800
2.30 P.M. . . . . R. B. C., 6,500,000
W. B. C., 10,900
4.45 P.M. Injected .5 gramme of calomel suspended in glycerin into the peritoneal cavity.
The material was prepared with aseptic precautions, and the syringe sterilized and bacterial infection avoided.
5 P.M. Animal seems very sick. Appears to be in a condition of shock.

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7 P.M.	R. B. C.,	6,450,000
	W. B. C.,	21,800
8 P.M.	R. B. C.,	6,700,000
	W. B. C.,	28,100

12 midnight, found dead.

These experiments indicate that the leucocytosis seen in inflammation of serous membranes is not due solely to the absorption of bacterial products, which occurs more readily here than in other tissues, but that it may also be produced by chemical substances, which are positively chemotactic and capable of setting up an active inflammation.

From the present state of our knowledge of this subject, it seems highly probable that all inflammations of the serous membranes (pleural, meningeal, and peritoneal) are attended with a distinct leucocytosis, unless the process is tuberculous in origin. This fact may often be utilized in making a diagnosis in obscure cases in which involvement of these membranes is suspected, and especially those in which inflammation about the appendix is suspected. From the experiments cited above, it would appear that leucocytosis is present early in the course of such cases.

The prognostic value of leucocytosis in troubles about the appendix still remains to be determined.

As bearing on this subject of inflammation of serous membranes, it is very interesting to consider for a moment the extraordinary phenomenon to which Professor John Guitéras first called attention,—viz., that the sudden removal of fluid from the large serous cavities is followed at once by a diminution in the number of leucocytes in the blood, this reduction amounting, on the average, to half the number present before the operation.

By the courtesy of Dr. W. E. Hughes, I was able to study six different cases in his wards at the Philadelphia Hospital, in which either the pleural or peritoneal cavity was tapped. In every case there was a diminution of at least one-half the number present before the tapping, and sometimes even a greater reduction took place. This came on at once, and was present whether there was an increased or a normal number of leucocytes before the operation.

Dr. Guitéras attributes this curious change to a reversal of the lymph current,—*i.e.*, that it is directed to the serous cavity, which has been suddenly emptied, instead of flowing into the veins.

V. *The Leucocytoses of Infections.*—(*a*) *Pneumonia.* As a rule, there is a distinct leucocytosis in cases of pneumonia, usually amounting to several times the normal number of leucocytes, coming on with the onset of the disease, and changing very slightly from day to day, disappearing suddenly with the crisis of the disease.

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The statements that the leucocytosis is in direct proportion to the extent of lung involvement, and that the leucocytosis is greater the day before the crisis, are not borne out by facts.

If we combine the cases reported by Rieder (26), by Ewing[1] (100), and by Cabot (72), we have a series of 198 cases. Of these, at least 48 died (Cabot does not state how many died of his last series of 24 cases); 13 cases did not show leucocytosis, and all of these died, excepting one (Cabot's case), and this one was apparently moribund, and remained so for a time, but when he began to improve, his leucocytes increased in number. Of Ewing's cases (100), 31 died with leucocytosis present, but of this number 13 were complicated by some other inflammatory process (pericarditis, endocarditis, nephritis), or by senility or alcoholism; 11 of the 31 cases showed such a slight increase (averaging but 9000 per cubic millimetre) that they do not deserve the name of leucocytosis.

As Ewing points out, the prognosis of pneumonia seems to depend upon the amount of poison generated, and the vigor of the systemic reaction, rather than upon the extent of lung involvement. In considering the relation between the degree of leucocytosis and these two factors, he divides his cases into three classes, as follows:

(1) Those in which the reaction of the system was *vigorous*, the rectal temperature having reached 105° F. or more, the pulse retaining its force until the lesion was well advanced, and when the condition was markedly sthenic, and a fatal issue seemed to result from some complication.

(2) Those cases in which the systemic reaction was *moderate*, the temperature amounting to 104°–105° F., and other symptoms were less severe.

(3) Those cases in which the reaction was *slight*,—the temperature never reaching 104° F., with only moderate prostration.

In 47 cases coming under the first class,—*i.e.*, *vigorous* reaction,—the average number of leucocytes was 31,000 per cubic millimetre. In 27 coming under the second class,—*i.e.*, *moderate* reaction,—the average number was 20,000. Of 27 cases characterized by *slight* or deficient reaction, and coming under the third class, the average was 9000. In this last group there were placed 11 asthenic cases, in 6 of which the number of leucocytes was subnormal.

Cabot contends that there is no relation between the degree of leucocytosis and the systemic reaction, stating that he has seen high counts in sthenic cases and in fatal cases. He does not say, however, whether or not there was any complication in these fatal cases.

It would appear that leucocytosis of lobar pneumonia may be

[1] Ewing, New York Medical Journal, December 16, 1893.

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slight (*a*) in mild cases, and (*b*) in those severe cases in which there is little reaction.

A well-marked leucocytosis does not always assure us that the disease will pursue a favorable course, but it is generally a favorable sign,

PNEUMONIA.

No. Case.	Age.	Day of Disease.	Result.	R. B. C.	W. B. C.	Remarks.
I	10 years.	. . .	Death.	4,945,000	38,000	Very ill; high temperature; necropsy showed extensive catarrhal pneumonia, fibrinous pleuritis, and purulent peritonitis.
II	4 years.	. . .	Recovery.	3,975,000	31,250	Few areas in both lungs; moderate severity; temperature 101°–103.0° F.
III	3 years.	6th	"	4,125,000	34,400	Very sick; extensive consolidation upper lobe right lung; temperature 103.0°–105.5° F.; pulse 150; respiration 50–55.
IV	16 months.	2 weeks.	Death.	4,025,000	31,000	Extremely ill; high temperature; rapid pulse and respiration; convulsions; necropsy showed few areas broncho-pneumonia in both lungs.
V	2⅓ years.	3d	Recovery.	4,775,000	17,200	Not very sick; slight temperature.
VI	2½ years.	. . .	"	4,550,000	15,600	Moderate temperature; pulse 120; respiration 44; recovery in few days.
VII	2 years.	5th	"	4,475,000	46,000	Moderate severity.
VIII	2 years.	7th	"	4,850,000	23,500	" "
IX	. . . . .	9th	"	4,750,000	25,000	" "
X	2½ years.	12th	"	4,800,000	48,400	Extremely ill; high temperature; rapid pulse and respiration.
XI	2¼ years.	4th	Death.	4,000,000	12,500	Pneumonia at base of right lung; temperature 103° F.; pulse and respiration rapid; seems quite sick.
XII	2½ years.	7th	Recovery.	4,450,000	29,700	Quite ill at time; pulse 150; temperature 103°–105° F.; respiration 40–50.

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provided there is no complication. On the other hand, the absence of leucocytosis seems to unmistakably indicate a fatal termination.

That the leucocytosis does not occur because we have a pathological process involving that delicate epithelium lining the alveoli, which closely resembles the endothelium of serous cavities, is evidenced by the fact that the leucocytosis disappears suddenly with the crisis of the disease before resolution has taken place. This would also indicate, together with the fact that leucocytosis is present from the first onset of the disease and remains at a certain point until the crisis, that the character of the inflammatory exudate, which occurs later in the course of pneumonia, leucocytic has nothing to do with the increase in the number of leucocytes in the circulation.

On preceding page there are twelve cases of catarrhal pneumonia. They clearly demonstrate that the extent of pneumonic involvement bears no relation to the degree of leucocytosis.

Death occurred in three cases. In one there was fibrinous pleuritis, purulent peritonitis, and extensive catarrhal pneumonia, and clinically this case presented a distinct leucocytosis.

In the other two, death occurred without complications, and yet distinct leucocytosis was present in one (Case IV); the other (Case XI) showed less leucocytosis than any other of the series.

(*b*) *Tuberculosis.*—The number of leucocytes in tuberculosis is extremely variable. As a rule, it may be said that tuberculosis does not produce leucocytosis. Chronic cases with long standing suppuration, or more acute cases with a secondary or mixed infection may show a leucocytosis. As already stated, the extensive tuberculosis seen in many cases without leucocytosis causes one to incline to the opinion that leucocytosis, when present in this disease, may not be due to the tuberculosis itself, but some other cause. Even acute miliary tuberculosis does not usually present leucocytosis. Cabot has only been able to collect four cases of acute miliary tuberculosis in which a blood count was made, and in all of them leucocytosis was absent. This was also the condition in his own case. The case mentioned above, in speaking of tuberculous meningitis, showed a slight leucocytosis (15,600).

It may be stated, then, that leucocytosis in tuberculosis is the exception rather than the rule.

(*c*) *Typhoid Fever.*—The leucocytes in this disease have been carefully studied by different men, and they all seem to agree with Thayer, who has given especial attention to this subject, and reached the conclusion that there is no increase in the number of leucocytes in typhoid fever, but, on the contrary, there is a distinct diminution in number. There is, however, a characteristic alteration in the fractional count.

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The multinuclear variety is decreased, but the pale mononuclear form is increased. It is especially the young cells of this variety of leucocytes that is increased,—those standing between the small lymphocytes, on the one hand, and the very large pale mononuclear cells, on the other.

This seems to be a well-established clinical fact, and may be of great use in the diagnosis of certain obscure cases.

(*d*) *Erysipelas.*—It is said that erysipelas constantly produces a distinct leucocytosis. My own experience with this disease has been limited to a few cases, in all of which there was a distinct leucocytosis.

(*e*) *Measles.*—It has been stated by various writers on leucocytosis that this disease is unattended by an increase of the leucocytes. The writer has counted the blood in seventeen cases of measles, at all stages of the disease, and in eleven of them failed to find any increase in the number of leucocytes. In six cases the number varied from 10,000 to 15,000 per cubic millimetre, and of this number one case developed diphtheria in a malignant form two days after the count, and another had an unusually severe rhinitis. The other four did not show any complications by physical examination, although the catarrhal symptoms in all of them were unusually severe. Of course, there might have been a slight broncho-pneumonia which was not demonstrable at the time by physical signs. In one case (Case XIII) there was a slight leucocytosis, and although there were no signs of pneumonia at that time, two days later catarrhal pneumonia was clearly demonstrable.

These results are confirmatory of the conclusions reached by others,—viz., that leucocytosis is absent in measles.

(*f*) *Diphtheria.*—The blood of patients with diphtheria has been said to contain a greater number of leucocytes than in any other infection, and it has been stated that the greater the leucocytosis the worse the prognosis. The writer gives below the result of blood examinations in thirteen cases of diphtheria. The cases are entirely too few to draw any positive conclusions, but a careful examination of the cases shows the following:

(1) Those cases which were very mild, and made a rapid recovery without ever having been very sick, show a *leucocytosis.* (Cases II, III, VI, VIII, and X.) The average of these five cases is 24,600 leucocytes per cubic millimetre. Only one showed a pronounced leucocytosis (Case II), and in that one there was a mixed infection, streptococci being associated with the Klebs-Löffler bacillus in the membrane.

(2) Those cases which were very sick or moderately so,—*i.e.*, showed considerable toxemia,—but recovered eventually, showed the highest degree of leucocytosis, the five cases averaging 46,280 per cubic millimetres (Cases VII, IX, XI, and XII).

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MEASLES.

No. Case.	Age.	Result.	Day of Rash.	R. B. C.	W. B. C.	Remarks.
I	5 years.	Recovery.	3d	4,725,000	7,800	Moderate severity.
II	10 years.	"	2d	4,400,000	6,250	Severe.
III	9 years.	"	1st	4,800,000	6,250	Severe; high temperature.
IV	5 years.	"	2d	4,600,000	4,700	Extensive rash; high temperature; had diphtheria 2 weeks later.
V	3 years.	"	2d	4,812,000	10,900	Moderate.
VI	5 years.	"	3d	5,000,000	15,600	Slight eruption; severe cough.
VII	5 years.	Death.	2d	4,300,000	12,500	Developed diphtheria 3 days later while rash out, and died in 2½ days. (See Case IV of diphtheria.)
VIII	2½ years.	Recovery.	1st	4,400,000	7,800	Mild.
IX	4 years.	"	3d	4,350,000	9,370	Moderate.
X	2¾ years.	. . . . .	. . .	4,440,000	10,900	"
XI	3 years.	Recovery.	2d	4,700,000	9,300	Severe.
XII	15 months.	"	3d	5,000,000	12,500	"
XIII	2 years.	"	3d	4,900,000	12,500	Catarrhal pneumonia, shown by physical examination 2 days later.
XIV	5 years.	"	2d	4,825,000	8,600	Moderate severity.
XV	5 years.	"	2d	4,500,000	5,475	Mild.
XVI	2 years.	"	3d	4,800,000	4,700	"
XVII	4 years.	"	3d	. . . . .	3,900	"

(3) Four cases died (Cases I, IV, V, and XIII). The average number of leucocytes in these cases was 32,300 per cubic millimetre. One case that died showed a pronounced leucocytosis (Case IV). This patient had a very malignant form of the disease coming on while the measles rash was still out. The membrane rapidly filled the pharynx, and extended into the larynx, making tracheotomy necessary. The blood count was made several hours after the tracheotomy. An autopsy could not be obtained, and it could not be determined whether or not there was any complication, such as pneumonia.

Although these cases are few in number, they appear to indicate that we have in diphtheria a condition analogous to that in pneumonia, —viz., that there is a slight leucocytosis in,—

(*a*) Mild cases with slight intoxication, and

(*b*) In cases which end fatally, in which there is an unusually severe intoxication or a feeble resistance on the part of the patient.

The greatest leucocytosis obtains in those cases which are subjected to a severe toxemia, but are able to withstand it and recover.

This will be referred to again when speaking of experiments with diphtheria.

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DIPHTHERIA.

No. Case.	Age.	Day of Disease.	Culture.	Amount of Membrane.	Degree of Severity.	Result.	Blood Examination.	Remarks.
I	5 yrs.	4th.	. . . . .	. . . . .	Severe.	D.	R. B. C., 3,500,000 W. B. C., 14,000	No culture. Croup symptoms. Great pallor, prostration, and moderate temperature. Died two days after count.
II	10 "	2d.	K.-L.[1] and strepto-cocci.	Extensive.	Mild.	R.	R. B. C., 4,237,500 W. B. C., 40,600	But slight prostration.
III	2½ "	5th.	K.-L.	Extensive.	Mild.	R.	R. B. C., 3,800,000 W. B. C., 18,750	Never very sick.
IV	5 "	2d.	K.-L.	Extensive.	Very malignant.	D	R. B. C., 4,000,000 W. B. C., 56,000	Profound toxemia. Membrane in larynx. Tracheotomy several hours before count. Death twelve hours later.
V	3 "	2d.	K.-L.	Extensive.	Very malignant.	D.	R. B. C., 3,737,000 W. B. C., 23,400	Convalescing from scarlet fever when diphtheria developed. Death fifteen hours after blood examination.
VI	5 "	3d.	K.-L.	Slight.	Mild.	R.	R. B. C., 5,020,000 W. B. C., 18,750	Rapid recovery.
VII	6 "	1st.	K.-L.	Slight.	Severe.	R.	R. B. C., 4,550,000 W. B. C., 28,000	Pulse rapid. Considerable hebetude and prostration. Appears very ill.
VIII	3 "	1st.	K.-L.	Slight.	Mild.	R.	R. B. C., 4,200,000 W. B. C., 18,300	Became quite ill later.
IX	7 "	3d.	K.-L.	Considerable.	Severe.	R.	R. B. C., 4,000,000 W. B. C., 78,000	Considerable membrane on both tonsils, which extended into the nose. Very ill for a time.
X	5 "	5th.	K.-L.	Considerable.	Mild.	R.	R. B. C., 4,700,000 W. B. C., 26,500	Membrane on both tonsils, but no great prostration.
XI	6 "	4th.	K.-L.	Considerable.	Moderate.	R.	R B. C., 4,600,000 W. B. C., 31,250	
XII	2½ "	8th.	. . . . .	Slight.	Moderate.	R.	R. B. C., 4,750,000 W. B. C., 50,000	
XIII	3 "	5th.	. . . . .	Extensive.	Severe.	D.	R. B. C., 4,200,000 W. B. C., 36,000	Membrane extended to nasal mucous membrane. Cervical glands greatly enlarged. Severe toxemia.

[1] K.-L. indicates that the Klebs-Löffler bacillus was found by culture.

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(*g*) *Scarlatina.*—A series of eleven cases of scarlet fever shows a pronounced leucocytosis. There was a moderate leucocytosis in all but two,—one of these was very ill, and three days later showed moderate leucocytosis (Case I). He developed diphtheria while desquamating, and died in three days. The other one without leucocytosis was scarcely affected by the disease,—except the slight fever. All the others were mild cases, and show from 12,000 to 30,000 leucocytes per cubic millimetre of blood.

While there is only a moderate increase in the number of leucocytes, there seems to be a departure from the normal, in the relative proportion of the different forms. This consists in an increase of the eosinophiles. All who have examined the blood in scarlet fever seem to agree on this point.

I give a fractional count of the leucocytes in four cases, only 500 leucocytes being counted in these cases.

SCARLATINA.

	Case II.	Case VIII.	Case IX.	Case X.
Lymphocytes	5.0 per cent.	11.3+ per cent.	3.0 per cent.	13.0 per cent.
Large mononuclear .	3.0 "	3.3+ "	2.0 "	3.0 "
Transitional	6.3 "	6.3 "	7.0 "	4.0 "
Multinuclear	82.0 "	76.0 "	86.0 "	76.0 "
Eosinophiles	3.6+ "	3.0 "	2.0 "	4.0 "

(*h*) *Septic Infection.*—The presence of pus in the body will produce a leucocytosis, unless the pus be tuberculous in origin. All are agreed that pus in the body is attended with leucocytosis, and this fact may often be made use of in diagnosis. Thus Cabot has found leucocytosis in fifteen cases of pus-tube or pelvic abscess, and suggests that this may be made use of in differentiating between this condition and many other affections likely to be confounded with it. We have already spoken of the importance of leucocytosis in the diagnosis of pathological conditions about the appendix vermiformis.

Cabot suggests that pus under tension is more apt to produce leucocytosis than when free. He found well-marked leucocytosis in patients with felons, in which there was a small amount of pus, while in paronychia with great pain but no pus, there was no increase in the number of leucocytes. The same observer examining two scalp wounds, in one of which the tissues were water-soaked and boggy but contained no pus, and in the other, which contained plenty of pus, found leucocytosis in the latter, but not in the former. This would indicate that the *presence of pus* rather than the condition under which it exists determines the condition of leucocytosis. It may be that all pyogenic

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Scarlet Fever.

No. Case.	Age.	Rash.	Desquamation.	Sore Throat.	Result.	Blood Count.	Remarks.
I	3 yrs.	. . . . .	Marked.	Slight.	D.	R. B. C., 4,562,500 W. B. C., 6,250	Count, March 31, 1894.
I	3 "	. . . . .	. . . . .	. . . . .	. . . .	R. B. C., 4,100,000 W. B. C., 15,600	Count, April 4, 1894. Few patches. Catarrhal pneumonia. Developed diphtheria next day, and died in three days. (See diphtheria table, Case V.)
II	10 "	Very bright 1st day.	. . . . .	Moderate patches.	R.	R. B. C., 4,700,000 W. B. C., 17,180	High temperature, April 15, 1894.
II	10 "	. . . . .	Distinct.	. . . . .	. . . .	R. B. C., 5,120,000 W. B. C., 18,700	Much improved. Has slight fever. April 22, 1894.
III	7 "	3d day.	. . . . .	Slight.	R.	R. B. C., 4,520,000 W. B. C., 15,600	Mild case.
IV	16 "	3d day.	. . . . .	Slight.	R.	R. B. C., 4,312,000 W. B. C., 6,200	Covered by rash, but does not seem sick, and has only slight temperature.
V	7 "	. . . . .	7 days.	. . . . .	R.	R. B. C., 5,200,000 W. B. C., 15,600	Desquamation well advanced. Boy seems perfectly well.
VI	3½ "	. . . . .	Beginning.	None.	R.	R. B. C., 4,940,000 W. B. C., 14,060	Very mild.
VII	1¼ "	. . . . .	5 days.	None.	R.	R. B. C., 5,200,000 W. B. C., 12,500	Extremely mild.
VIII	5 "	3d day.	. . . . .	Slight.	R.	R. B. C., 3,350,000 W. B. C., 14,000	Covered with rash. Slight fever.
IX	4 "	2d day.	. . . . .	Slight.	R.	R. B. C., 4,700,000 W. B. C., 18,750	Has vaccination at same time. Much sicker than others.
X	5 "	2d day.	. . . . .	Slight.	R.	R. B. C., 4,750,000 W. B. C., 29,000	Moderately severe.
XI	8 "	9th day.	Marked.	None.	R.	R. B. C., 4,525,000 W. B. C., 11,720	Mild case.

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bacteria do not produce leucocytosis. The variable degree of leucocytosis in the different specific infections indicates that all micro-organisms do not produce this condition to the same degree. In regard to the different ordinary pus-producing organisms this still remains to be determined.

To determine whether or not a chemical substance which is positively chemotactic could produce leucocytosis when injected subcutaneously, the following experiment was performed:

Medium-sized rabbit. Has an abscess on side from inoculation in a previous experiment.

3 P.M.	R. B. C., 5,300,000
	W. B. C., 21,900
3.30 P.M.	R. B. C., 5,500,000
	W. B. C., 28,000
4.30 P.M. Injected subcutaneously .5 gramme calomel suspended in glycerin. Used sterilized syringe.	
7.30 P.M.	R. B. C., 6,000,000
	W. B. C., 72,600
12 midnight	R. B. C., 5,600,000
	W. B. C., 59,300

This indicates that other substances than bacteria or their products are capable of producing leucocytosis, when thrown into the cellular tissues.

In closing the subject of the infections, I would like to mention the following case of noma or gangrenous stomatitis:

S. S., aged 3 years. Had been sick several days before admission. Admitted to the wards of Dr. Samuel Ashhurst, Children's Hospital, March 27, 1894. Child very sick. Gangrenous area has been thoroughly curetted and treated with antiseptics. There is a slight perforation of cheek; red blood-corpuscles, 3,500,000; white blood-corpuscles, 25,000. March 29, 1894. Child very sick, evidently moribund. Gangrenous condition has extended rapidly in last two days, until nearly the entire cheek is destroyed. Blood count two hours before death, red blood-corpuscles, 1,375,000; white blood-corpuscles, 28,100.

[TO BE CONTINUED.]

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CLINICAL DEPARTMENT.

UNIVERSITY HOSPITAL.

MEDICAL DISPENSARY.

PLEURAL EFFUSIONS.

THE following cases of pleural effusions have been selected from the great number which presented themselves at the dispensary during the past year, to illustrate the different varieties and as a basis for a few remarks upon the etiology, symptoms, and treatment of this interesting phase of disease.

CASE I.—Frank K., aged 64; laborer; family history indefinite; never had rheumatism; a moderate drinker. Four weeks before application at the service, November 1, 1893, he was seized with a severe attack of dyspnea. Careful questioning developed the fact that he had been constantly dyspneic with palpitation of the heart on exertion for some months.

Physical Examination.—Apex-beat of heart not visible, but felt in fifth interspace, nipple-line. The superficial cardiac dulness is bounded by the fourth rib, left border of sternum and nipple-line. Cardiac action is extremely irregular. At the aortic cartilage the heart-sounds are accompanied by a faint systolic murmur, and are irregular and weak. *Lungs.*—On left side there is dulness below sixth rib. There is good tactile fremitus at both bases. The breath-sounds are harsh and accompanied by fine crackling râles. A diagnosis of fatty degeneration of heart with edema of lungs was made, and strychnine and digitalis ordered.

Patient did not return for three months,—February 24, 1894,—when there was marked flatness at both bases. The dulness was movable, and puncture with needle showed the presence of a clear liquid. He again disappeared for two months, to answer again April 20, 1894. At this time he had general anasarca, urgent dyspnea, a scarcely perceptible pulse, and a large amount of effusion in both chests. He was taken into the ward, put to bed, and given digitalis and strychnine. In four weeks he was as well as he "ever was," and was up and about. The effusion entirely disappeared with the strengthening of the heart.

CASE II.—July 7, 1894. William C., aged 23. Father, mother, and one sister living and well. In infancy he had asthma; but health was good until one year ago. At that time he caught cold, and lost thirty-three pounds of weight in two weeks, but has kept the same

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weight since. Yellow expectoration; no night-sweats; appetite good; pain in back; urgent dyspnea, and palpitation on the least exertion.

Examination.—Much emaciation; marked depression, especially under left clavicle. The left shoulder droops. Tremendous distention of the entire right chest, measuring two inches more than left side. Flat note on percussion; slight tactile fremitus; at the extreme apex the tactile fremitus is greater than at any other point on right side. Blowing breathing at extreme right apex. Over the entire right chest there is *hollow, prolonged expiration.* The *whispered voice* can be heard well over whole right chest. The voice and breath-sounds are exaggerated over the left chest. The apex-beat of the heart is in the sixth interspace and axillary line. So great is the distention of the right chest that the right edge of sternum is tilted forward. There was a slight fever.

A puncture was made and pus withdrawn. Aspiration was then performed, and at two sittings *six* quarts of pus were withdrawn from the chest. The patient bore the tappings very badly, and went into collapse after the last one. Two days after the last tapping permanent drainage was established by means of aspiration drainage. Patient was etherized. A large trocar and canula, three-eighths of an inch in diameter, were inserted in the seventh interspace. The trocar was removed and a gum tube, which fitted the canula exactly, was pushed into the chest through the canula. The canula was then withdrawn and the tube allowed to remain in chest, and retained there by silk passed through the tube and tied around the body. The free end of the tube was then attached to a glass tube inserted through the cork of a bottle and extending to the bottom of a boracic acid solution contained in the bottle. A second opening was made in the cork for the ingress and egress of air.

Immediately after the withdrawal of the last of the pus both sides of the chest measured the same, the heart came back to its normal position. Breath-sounds were heard over the whole right chest, and at the apex were fairly normal in character.

During his stay of one week in the hospital the temperature ranged between normal and 101° F., usually, however, about 99.5° F.

Various examinations of both sputum (which was very scant) and the pus were made for tubercle bacilli, but none were found.

The patient went about carrying the bottle in his pocket and attached to his tube. He eats well; walks without dyspnea.

Some weeks after the tapping the sputum became more profuse, and was found to contain myriads of tubercle bacilli. About the same time the exudation became extremely fetid, and, in spite of careful washing of the cavity, remained so until death.

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CASE III.—John B., aged 28; single; salesman; family history is good. He was perfectly well until spring of 1891, when he began to cough blood. One and a half years ago he developed cough. Has lost much flesh; his appetite is poor. He has night-sweats, and hectic. On examination there is seen to be much less movement on left side than on right, with the cardiac impulse somewhat to right of sternum. The whole left chest is hyper-resonant, the cardiac dulness being lost. On left the tactile fremitus is entirely lost. The breath-sounds are feeble and distant. The expiration is prolonged and hollow.

August 9, 1894. Three months after the first visit he returned with flatness on percussion at left base. The dulness is movable, and accompanied with a marked succussion splash. The breathing above the dulness is amphoric with tinkling râles. There is marked bell tympany.

October 10, 1894. At the base there is still movable dulness, but the signs of pneumothorax have entirely disappeared. The case was to return for resection, but failed to put in an appearance.

CASE IV.—Wm. R., aged 27; white; married. Family history excellent, there being no trace of phthisis in the family. No serious illness until three and a half years previous to visit, March 26, 1894. At that time he had a slight cough, which continued. He gradually lost flesh and strength. He spat blood in September, 1892, and again in June, 1893. In October, 1893, he started for Denver, Colorado. On boarding the train at Chicago, he was seized with a pain in the left side so severe that he was rendered unconscious, and did not become entirely conscious until he reached Denver. He was there admitted to the hospital, and soon afterwards the side was tapped, and what the patient described as pure serum removed. He was again tapped January, 1894, but without result. He returned to Philadelphia, March, 1894, and immediately came to the University Medical Dispensary. He was *slightly* short of breath. On examination the left chest was found much distended, and a marked pulsation between the second and fourth *right* intercostal spaces. Apex-beat absent from its normal position. Spinal column bowed to the right. There was absolute dulness of entire left chest, except at the extreme apex. Over the area to the right of sternum, where the pulsation was seen, there was dulness. Voice-sounds were absent over the left chest, as were the breath-sounds. Tactile fremitus, but over the dulness. The chest was tapped, and three quarts of bloody fluid removed. After the tapping, dulness still persisted over the left side, the apex beat of heart felt in normal position, and the pulsation and dulness had disappeared from the upper part of chest to the right of sternum. Breath-sounds could be fairly well heard in the left chest.

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On April 9, 1894, the fluid had reaccumulated, and he was again tapped. The fluid was sero-purulent in character, and had lost its bloody characteristic. He was again tapped, and one quart of liquid removed; the heart was just to the right of sternum. Tubercle bacilli were found in sputum and exudate.

On May 25, the fluid having again accumulated, the chest was opened and aspiration-drainage performed, as in Case II. The case did fairly well until August, 1894, though there was always a great deal of tenderness about the tube. The liquid also became extremely fetid in this case as in the other one of drainage. In the latter part of August a rib was resected, and the patient at present is doing well.

CASE V.—Annie S., aged 12; has had cough and pain in right chest for several weeks. The patient is dyspneic; has much palpitation of heart; the lips are blue and hands cold. On examination the left chest is found to have less movement than right. There is dulness on percussion below the fourth rib, and this dulness is movable. The apex-beat of the heart is almost in the nipple-line in the fifth interspace. Over the *entire area* of percussion dulness the breath-sounds are feeble, and accompanied by a *loud, dry* friction sound. The chest was tapped and sixteen fluid ounces of serum removed. There has been no return of the liquid, and the child is much improved.

CASE VI.—Clarence S., aged 17; barber. Family history good. No serious disease previous to the present illness. Two weeks before the first visit at the dispensary, July, 1894, he was suddenly seized with pain in the lumbar region, which did not radiate down the groin or around the abdomen. Appetite was good. It was difficult for the patient to inspire deeply. No cough. Temperature 100° F. On examination the patient was pale and ill-nourished. Slight curvature of the upper third of the spinal column. There was pulsation in the second interspace to *right* of sternum. Movement of chest-wall less on left than on right. On percussion there was dulness on the left side, beginning at the third rib anteriorly and the spine of scapula posteriorly. Tactile fremitus was entirely lost over the left base. Over the area of pulsation to the right of sternum there was dulness, and the heart-sounds are well heard in this position.

The chest was immediately tapped, and one quart of serum removed. The heart immediately resumed its normal position, and the dulness on percussion disappeared. He returned several times, and on the last visit was in an entirely normal condition.

Since writing the above, this patient has returned with a pleural effusion in *right* chest. This was tapped, and the patient is again well.

Case I is a good example of a double effusion occurring in the

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course of heart-disease as a result of the faulty action of that organ. The case is traced from the first symptoms of water-logging of the lungs themselves to the filling of both pleural cavities with liquid. The treatment followed in this case, absolute rest, light diet, combined with digitalis and strychnine, gave prompt and prolonged relief. It can be confidently relied upon to relieve in almost all cases of like character. Purging may in still more extreme cases be a necessary measure. Tapping is comparatively seldom demanded. Cases II, III, and IV are examples of empyema, the result of tubercular pleurisy. Case II is especially remarkable for the unusual amount of liquid removed and the length of time the effusion existed. The patient had visited several hospitals, but the condition remained unrecognized, doubtless by reason of a rapid and cursory examination, all too frequently made in the outwards of our various hospitals. The presence of prolonged hollow expiration and whispered voice sounds over the liquid disprove the infallibility of Baccelli's theory that these signs occur only over a serous effusion. The great displacement of the heart was the sign which next to tapping decided the diagnosis. Both this and Case IV are examples of aspiration drainage done and treated under careful precautions, both of the cases became fetid, and in the last was promptly relieved by resection of a rib. It would seem to be strongly indicated by both of these cases that resection of one or more ribs is much preferable to aspiration drainage as a permanent operation. The tube irritates the chest-wall, becomes loose, and allows infection of the pleural contents. Case IV is an example of the frequency of bloody exudates in tubercular pleurisy. The presence of a bloody serum as a pleural exudate is pretty good evidence of either tubercular or malignant disease. Case III is an unusual instance in which the steps of pneumothorax, pyopneumothorax, and pyothorax are observed in the same patient. On his first visit he had a pure pneumothorax, and it will be noticed that the heart was displaced. On his third visit he had a typical pyopneumothorax, and on his last visit simply a pyothorax.

Case V illustrates the necessity of an exploratory puncture for a sure diagnosis between effusions and consolidations or thickened pleuræ. In this case the presence of loud friction sounds heard over the entire effusion made us hesitate as to the presence of a liquid, though the displacement of the heart more than any other sign made us suspicious. The explanation in this case must be that the liquid being small allowed the friction to occur in the upper part of the chest. The sounds were so loud that they were well heard over the effusion.

Both Cases V and VI are examples of the beneficial effects of early tappings. It seems absurd to allow a lung to be compressed, and a patient distressed by a pleural effusion when such a simple and harm-

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less operation will at *once* give relief, which in simple pleurisies is usually permanent.

We have come to look upon displacement of the heart as the most valuable physical sign of pleural effusions as distinguished from consolidation. Case II shows how the voice-sounds and breathing may simulate consolidation, and Case V how friction may be heard over a liquid. Distention of the side and movable dulness, of course, are valuable signs, but the chest may be so full or the effusion so bound down that it is immobile, while an effusion insufficient to cause distention will invariably cause dislocation of the heart more or less marked.

M. H. FUSSELL,
Physician in Chief.

ALUMNI NOTES.

IN order to increase the usefulness of the Society of the Alumni of the Medical Department of the University of Pennsylvania, a brief appeal has recently been issued to a large number of those graduates not already members of the association.

In the past the Society has been forced to content itself with,—

(*a*) The publication of an annual report.

(*b*) The awarding each year of a bronze medal to the student receiving the highest general average at graduation.

(*c*) The preparation of an annual banquet, at which the cost of entertaining the graduating class has, for several terms, been equally divided between the Faculty of the University and the Supper Committee.

A decided increase in the membership will enable the Society to add $50 as an accompaniment of the bronze medal, or provide for the casting of the same in gold, if desired. Other prizes might also be established as funds permitted, and the complete graduate catalogue pushed to early completion.

Thomas Hubbard, M.D., of 205 Ontario Street, Toledo, for two years secretary of the Ohio State Medical Society, has recently completed his labors on the Transactions of the same, to be reviewed elsewhere in this journal.

APPOINTMENTS.

Dr. I. B. Hamilton, Class of 1883, who last winter was located at Tombstone, A. T., and who collected antelope for Dr. Harrison Allen, has been appointed surgeon to the Congress Gold-Mining Company.

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Dr. Hamilton is now engaged in making a mineral collection for the University of Pennsylvania.

Dr. Charles A. Oliver has been appointed Ophthalmic Surgeon to the B. & O. R. R.

The following Consultants have been appointed to St. Agnes's Hospital: Dr. Michael O'Hara, Sr., Consulting Physician, and Dr. John Grove, Consulting Surgeon.

Dr. Burton K. Chance, of the Class of '93, has been elected Resident Physician to the Wills Eye Hospital.

Dr. A. A. Stevens, of the Class of '86, has been appointed Visiting Physician to St. Agnes's Hospital.

NECROLOGY.

Dr. Abraham Rothrock died at McVeytown, Mifflin County, Pa., September 9, where he had practised medicine for almost sixty-five years. He was born in Derry township, Mifflin County, Pa. In 1826, when 20 years of age, he commenced the study of medicine, and entered the Medical Department of the University of Pennsylvania in the fall of 1828. After one course of lectures he commenced practice at McVeytown; returning later he graduated from the University in 1835, since which time he continued in practice at McVeytown until some three years ago. During his many long years of work, his practice was both large and arduous, and located in a field entailing great hardships and exposure.

He was a great reader, and an earnest student, thus keeping himself abreast with all that pertained to his profession; although situated at a distance from medical schools, or the source of professional supplies, yet his patients received promptly the benefit of any advances or discoveries in the healing art.

He was a member of both the County and State Medical Societies; the first vice-president of the latter in 1878. During the late Civil War he was appointed to the office of Examining Surgeon to the Board of Enrolment in the Seventeenth Congressional District of Pennsylvania. His conscientious efforts and impartial decisions in this important work proving his peculiar fitness for this office, and his report to the Surgeon-General's Department at Washington, was most highly commended. He was a man of irreproachable character; his name standing for everything that was substantial or good in the community.

In May, 1837, he married Phœbe Brinton, daughter of Joseph Trimble, of Delaware County, Pa., whose life fully supplemented his own. He was the father of Joseph T. Rothrock, M.D., formerly Pro-

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fessor of Botany in the University of Pennsylvania, who with two sisters survive him.

Dr. William A. Culpeper died on the 4th inst., at Barbadoes, West Indies. He graduated from the Medical Department of the University of Pennsylvania with high honors in the class of 1883. He afterwards served as resident physician in the Philadelphia and University Hospitals.

Dr. C. W. Coleman died at Williamsburg, Va., September 15, 1894. After graduating from the University of Pennsylvania, he began the practice of his profession in Richmond, but soon removed to his native town, with which place he remained intimately identified, professionally and socially.

Labor and Heart-Disease.

Tarnier (*Journal des Sages-Femmes*, January 16, 1894) notes that in heart-disease all great and sudden efforts put the patient in peril, and labor is no exception to the rule. Running up-stairs, racing to catch an omnibus or train, and sexual intercourse may all cause fatal syncope. The danger of labor is not special in this sense; it is dangerous in heart-disease simply because it involves much effort. Tarnier induced premature labor in a lady who was subject to advanced heart-disease. Notwithstanding all precautions, she became moribund in the course of the labor. Directly she died, he turned and delivered a live child, which survived. A woman was brought into Tarnier's wards in January, 1894, in labor, with advanced heart-disease and asystolism; she was apparently dying. Immediately about 300 grammes of blood were withdrawn, and the symptoms of suffocation diminished. The patient grew calmer. As it was extremely advisable to bring on labor quickly, as the forceps is apt to fatigue the patient, and as, in particular, the child was dead, the basiotribe was applied and delivery effected. A few days later the mother was doing very well.—*British Medical Journal.*

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EDITORIAL.

APPENDICITIS.

It is hardly too much to say that at the present time no subject connected with medicine is demanding more attention than appendicitis. This is due not only to the fact of its great relative frequency since we have been able by a better understanding of its symptoms to recognize its presence, but also because there exists such marked diversity of opinion in regard to the proper treatment of the disease. The time is quite within the recollection of many physicians when appendicitis was rarely heard of, the affections in the right iliac fossa being usually considered typhlitic. Then came the period when the inflammations in this region were said to involve the cecum, the tissues around the cecum, and the appendix, the affections being designated typhlitis, perityphlitis, and appendicitis. This time is so recent that even the youngest practitioner of to-day received this teaching as a student. At present typhlitis and perityphlitis are scarcely referred to in current literature, unless it be to call attention to the confusion which existed in the professional mind concerning these conditions a few years ago. It cannot be denied that typhlitis may and does occasionally exist, but it is so overshadowed in frequency by appendicitis that the latter deservedly claims almost undivided attention.

The views which are at present held on the subject of appendicitis are of such recent origin that only the most modern text-books give anything like a satisfactory account of the affection, and there is such a great variety of opinion respecting the treatment of the disease in the literature of to-day that the student and even the physician is often quite puzzled after reviewing the diverse theories to form a definite idea of the proper course to pursue.

Of all the characteristics of appendicitis, none stands out so prominently as the sudden and fatal change which is likely to occur even in what has appeared to be a mild case. There is absolutely no way to foreshadow this change, and the only safety for the patient lies in a keen appreciation of this fact by the physician, in having the case constantly under the observation of a skilled attendant, and in being prepared for such an emergency by having the assistance of a surgeon from the beginning, who is thus familiar with the details of the individual

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case, and consequently prepared to operate at any time that such a course seems indicated. It is not an infrequent experience for the surgeon to be called to see a case of appendicitis when the patient is almost moribund. There are several reasons for this occurrence. The physician at his morning visit may have found the patient in a satisfactory condition; soon after his departure a perforation may occur, and unless the attendant is experienced in this class of troubles, and is able to discern the signals which should excite alarm, some hours may be passed over before the change is noted. This delay may, and constantly does, make the difference between life and death to the patient. Even if the change has been promptly noted, the physician may not be at once accessible, and some hours may elapse before his next visit, or before he can be found; then, if he concludes to send for a surgeon another delay is incurred, and the hasty preparation for the operation still further robs the patient of precious moments.

On the other hand, so many primary cases recover without operation that a correct view of the abortive treatment is most desirable. Equally important are the better understanding of the measures necessary to bring about permanent recovery, and the better discrimination between the cases that may be expected to recover without operation and those that will need such interference. There can be no doubt that there have been many needless operations for appendicitis.

It is gratifying to learn that a recent effort has succeeded in placing at the disposal of patients having appendicitis a number of beds in the University Hospital, notice of which will be found in another part of the MAGAZINE. The ward is to be under the care of Professors William Pepper and J. William White, who are engaged in a special study of the symptoms, treatment, and pathology of this affection. The medical and surgical features of the disease will be studied together from the outset. Especial features of the investigation will be the studies in the morbid anatomy and the bacteriology of the disease, which will be conducted in special laboratories connected with the University. In addition to affording this class of patients the care and attention which could not be secured outside of an institution of this kind, it is hoped that the results may aid materially in settling the disputed and doubtful points which now exist.

THE HYGIENE OF THE MOUTH.

WITH the development of bacteriology has come the knowledge of the presence of microscopic life everywhere. This very fact tends to lessen the full appreciation of the dangers of their presence if favorable

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conditions should develop for their growth. The *rôle* played by micro-organisms in many morbid processes has now been established, and the list of these diseases must constantly be added to.

In a recent lecture before the Wistar Biological Association, entitled "The Bacterio-Pathology of the Mouth and its Significance in its Relation to General Diseases," Professor W. D. Miller, of Berlin, stated that thirty-two distinct species of germs had been found in the mouth, and directed attention forcibly to the need of careful attention to this cavity. Galen, who lived in the second century, was the first person to record the poisonous qualities of human saliva of which we have record. Since that time the observation has been frequently repeated both by early medical writers and those of the present day. It is now known that these poisonous properties depend upon the presence of micro-organisms, some of which are quite virulent, while others are harmless. One of the most important of the buccal bacteria is that which causes caries of the teeth. The first effect of decayed teeth, if not attended to, is, of course, imperfect mastication, and as a consequence indigestion with its usual train of symptoms. In some cases, an abscess forms at the root of the tooth; as a result of this necrosis of the jaw may follow, and either septicemia or pyemia may develop.

Dr. Miller has collected 200 cases in which death has resulted from one of these conditions, which began as caries of the teeth. Among these were several instances of necrosis of the jaw, abscess of the lung, and other parts, etc. It is thought that many of the abscesses whose cause cannot be explained, and other infections, the origin of which is not apparent, may be due to the invasion of germs, the latter having entered the body through a carious tooth.

It has been found as a result of a large number of observations that enlargement of the lymphatic glands at the angle of the jaw constantly accompanies carious teeth. It is not unlikely that decayed teeth may furnish a ready means of entrance for the tubercle bacillus. Experience certainly shows that the cervical lymphatic glands are very frequently the seat of tuberculosis. It is probable, at least, that if pathogenic organisms do not find entrance into the body through this channel, the irritation of the gland resulting from the decayed teeth so diminishes its powers of resistance that disease is much more likely to follow.

It was also pointed out that the diplococcus of pneumonia, which is thought to be the cause of croupous pneumonia, was identical with the micrococcus of sputum septicemia. The coccus described by Friedländer evidently is not inspired, in as much as it cannot survive long in the air; whereas its presence in great numbers in the mouth renders

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it an easy matter for the lungs to become infected whenever the usual powers of resistance are sufficiently diminished.

The tonsils are also apt to contain a variety of micro-organisms. Their richness in crypts and follicles, together with a weakened resistance which supervenes upon the frequent inflammatory attacks, so common with many people, offers a particularly suitable soil for germs. The collections of yellowish offensive matter that sometimes occur in the tonsils have been found to consist almost entirely of micro-organisms. A number of authors have now described diseases in which the tonsils are supposed to have been the port through which the germs found their way into the body. The list has recently been augmented by the addition of rheumatism.

The practical deduction is that increased care should be devoted to keeping the mouth perfectly healthy. This will be one of the features of "preventive medicine," the dawn of which is evidently approaching.

A BUST OF DR. LEIDY.

GRADUATES of the University of Pennsylvania will be pleased to learn that a suitable memorial of the late Dr. Leidy is to be placed in the library of the institution. Dr. Leidy held the professorship of anatomy for thirty-nine years, and his services and labors have given imperishable fame to the University. The memorial will be in the form of bust modelled from a death-mask, obtained by the sculptor, Mr. John J. Boyle, and from various enlarged photographs. The work, which is already finished and awaiting final acceptance by the Committee of Trustees, is to cost $800, all of which sum has been contributed by the friends of Dr. Leidy.

THE WISTAR BIOLOGICAL ASSOCIATION.

THE first meeting of this organization was held in the lecture-room of the Wistar Institute of Anatomy, on the evening of October 12, 1894. Dr. John Macfarland, Professor of Botany, delivered a lecture on some recent botanical investigations. Although the association has but recently been organized, it has a membership of 150. The purpose of the organization is to promote scientific investigation, and to enable the laity to keep in touch with the advances made in biological sciences. The officers of the association are: Mr. Isaac Jones Wistar, President; Dr. Horace Jayne, Vice-President; and Dr. Milton J. Greenman, Secretary and Treasurer.

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MEDICAL PROGRESS.

MEDICINE.

UNDER THE CHARGE OF

WILLIAM PEPPER, M.D., LL.D., AND JAMES TYSON, M.D.,

ASSISTED BY

M. HOWARD FUSSELL, M.D.

ASTHMA IN CHILDREN.

DAUCHEZ (*Revue des Maladies de l'Enfance*, July, 1894) thus concludes a valuable article on the above subject.

(1) Infantile asthma is in the greater number of cases a reflex symptom. Being symptomatic of some excitation on the cutaneous or mucous surface, or sometimes due to visceral trouble. In the beginning, if the cause is recognized and combated, it is easily curable. Later the cure is much more delayed.

(2) Sometimes the symptomatic and reflex asthma is hereditary and constitutional. In these cases it is a true asthma due to arthritism in neuro-arthritic subjects with a spasmodic tendency. In these cases it is often persistent.

(3) Recovery is frequent when there is no asthma in the antecedents, if the hygiene is good and the treatment climatic.

(4) When asthma develops in the younger children, it is most curable.

(5) Asthma is a disease of adolescence and adult age.

(6) The frequency of occurrence in the child is between 5 and 10 years.

ACUTE DISSEMINATED MYELITIS.

DRESCHFELD (*British Medical Journal*, June 2, 1884) reports the following case: J. R., aged 23, had enjoyed good health until April 20, 1893. He was especially fond of athletics. There was no syphilis, and his habits had been regular. In the middle of April he fell into a pond, and had to walk two miles to change his garments. In two weeks he suffered severe pain on the right side of the head and rapidly lost the sight of his right eye. Examination showed optic neuritis. Soon after he was confined to bed with pain and swelling of right leg, and on attempting to go about found he could not use his left leg. Soon after he had numbness in both legs. Complete loss of power of left leg, and a girdle pain at the region of the xiphoid. He had incontinence of urine, followed by retention.

May 20, 1893, he was in bed, unable to walk. He had no pain. He had a right optic neuritis, all other cranial nerves normal. The radial and triceps reflexes were increased. The upper part of the trunk appeared normal. About two inches below the xiphoid there was a line of anesthesia on the right and paresthesia on the left. The anesthesia affected the whole right half of the body below this point; the paresthesia the left half. There was complete loss of power of left leg, and weakness of right leg. The knee reflexes were increased.

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The symptoms rapidly grew worse, and he died from asphyxia on July 27. Post-mortem.—Great emaciation. Brain normal but edematous. Optic nerves presented red points on transverse section. Spinal cord. Dura distended with fluid, but there was no pus or blood; the pia was not thickened; the upper part of cord from the second cervical to the end of the cervical enlargement was almost diffluent; the dorsal and lumbar portions were free. On hardening and staining after Weigert there were found,—

(1) Irregularly distributed patches of myelitis.

(2) In some places the patches occupied one-half of the cord, in others they could be recognized only by the microscope.

(3) The changes were most marked around the blood-vessels.

(4) There was marked distention of the perivascular sheaths with leucocytes and compound granular cells.

(5) There was well-marked ascending degeneration of the posterior columns. Sections of the optic nerves showed patches of degeneration.

Bone-Marrow in the Treatment of Pernicious Anemia.

Fraser (*British Medical Journal*, June 2, 1894) reports *one* case of pernicious (?) anemia treated with all the symptoms due to extreme anemia. The blood count was 1,860,000 reds, with 30 per cent. hemoglobin, and 1,460,000 reds, with 28 per cent. of hemoglobin, with much distortion of the corpuscles.

During the administration of full doses of arsenic and iron the corpuscles fell to 843,000, and the hemoglobin to 18 per cent. Ox-bone marrow, uncooked, was then added to the treatment, three ounces daily, with almost immediate improvement. Thirty-two days after beginning the bone-marrow the corpuscles were 3,400,000, and the hemoglobin 75 per cent. The patient was discharged after about three months with his blood in this condition, and feeling "as though he had been made over again."

Scleroderma.

Eulenberg (*Wiener medizinische Wochenschrift*, No. 93, 1894) cites several cases of this disease, one of which ran a fatal course in two years, and began with symptoms of tabes. Later the diagnosis was trichinosis, due to the swelling of the eyelids and the muscles. Still later the diagnosis was polyneuritis. Errors in diagnosis are especially frequent when the disturbance begins in the proximal ends of the limbs. Then the characteristic signs of the disease, the tense pain, the paresthesia, the cold sensations, etc., are looked upon as signs of a nervous disturbance. In a fully-developed diffuse scleroderma, of course, there can be no doubt of the diagnosis. In the beginning of the disease the marked stretching of the skin, the mark-like condition of the features, and the enlargement of the hands and feet are characteristic. The disease is rare, occurring between 20 and 52 years in the cases observed. The clinical symptoms are marked by disturbances of sensation. Sometimes there is motor disturbance, but this is seldom. There are many trophic disturbances, however. The face may become atrophied, and spots of ulceration occur. In the small joints there may be enlargement of the ends of the bones. The excretion of sweat is sometimes but not always diminished. The general symptoms which occur in the most severe cases are loss of flesh and strength. There are no pathological lesions found in either the cord or the peripheral ganglia or nerves.

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The Etiology and Time of Incubation of Follicular Tonsillitis.

Wolberg (*Archiv für Kinderheilkunde*, Vol. xvi, Parts iii and iv, 1894) reports some observations upon the above disease, and concludes,—

(1) That follicular tonsillitis can doubtless be communicated from person to person.

(2) The duration of the diseases varies from three to four days.

A Simple Method of Increasing the Double Crural Murmur in Aortic Insufficiency.

Lannois (*Lyon Médical*, June 17, 1894) noticed in examining certain patients with double aortic disease that strong pressure on the crural artery caused a to-and-fro movement in the artery above the point of pressure, and a very marked diastolic thrill. Auscultation of the artery made above the point of compression showed the diastolic sound very marked. If it could not be heard in the artery usually, then compression caused it to become audible.

Antitoxin in Diphtheria.

Katz (*Berliner klinische Wochenschrift*, July 16, 1894) reports for Baginsky the result of treatment of diphtheria in the Children's Hospital in Berlin with *Aronson's* antitoxin. In four years 1081 cases of diphtheria were treated, with a mortality of 38.9 per cent. In the three and a half months immediately preceding the beginning of treatment by antitoxin there was a mortality of 41.8 per cent. During the three months in which antitoxin was used there were 128 cases so treated, with a mortality of 13.2 per cent. Adding to these cases 15, which for good reasons were not treated with antitoxin, the mortality was 16.5 per cent. Nephritis was no more common in the cases on whom antitoxin was used than on the others, and was not of so severe a type. Once there was an abscess at the seat of the injection. Nine times an eruption appeared either at the region of the injection or on the extremities. There was no constitutional disturbance with these exanthemata, however. Sometimes the rash resembled scarlatina, sometimes measles. Four times urticaria appeared. The *exudation* was not influenced in an unusual way, but in not a single case of the 128 treated was the larynx affected after the use of the remedy. There was no effect on the swelling of the glands. Indeed, the course of the disease was generally affected, and no special symptom was marked.

Eighty-two healthy children were injected with a diluted solution of antitoxin for the purpose of vaccination. Eight of these became slightly ill, but none seriously. At the time of writing none of these children were sick with diphtheria.

He believes it is too soon to state a positive conclusion, but thinks the treatment is the best so far suggested, and awaits further trials.

Easters (*British Medical Journal*, July 21, 1894) reports one case of diphtheria in which all the usual methods of treatment were used, and the child steadily grew worse. On the third day the writer injected five cubic centimetres of Aronson's antitoxin, when an immediate effect was noted. Four days after the injection the patient was well.

Heubner (*Jahrbuch für Kinderheilkunde*, Vol. xxxviii, Parts ii and iii), in a paper read at Rome at the International Congress, compares the result of the treatment of three groups of cases of diphtheria.

The first group was treated entirely without the serum,—113 cases, with a

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mortality of 64.6 per cent. The second group, 129 cases, 79 of which were treated with the serum, had a mortality of 42.6 per cent. The third group of 118 cases, none of which received the serum, had a mortality of 45.7 per cent. The cases treated in the serum period were of about the same as those treated in Period III. During the time which the writer could get the serum to use, 96 cases came under observation. Seventeen of these were mild and were not injected. Comparing these 96 cases with 96 from each of the other periods, the percentages stand as follows:

Period.	Cases Treated.	Mortality.
I (without serum)	96	62.5 per cent.
II (79 with serum)	96	38.5 "
III	96	49.0 "

As will be seen, a slight change in favor of the serum period.

The cases which required operation were in no way affected by the use of the serum, nor was the percentage of cases requiring the serum materially lessened.

The author found that the cases which were treated with the serum of greatest power did better than those treated with weaker serum.

There were no bad results observed, never any abscesses or induration at the seat of injections, and there was never any carbolic acid poisoning observed, notwithstanding the considerable amount of acid injected with the serum in some of the cases.

He concludes that in his experience the serum used, while it had a marked influence on the course of diphtheria, did not act as a specific. It should be given further trial in a larger number of cases.

In the Congress at Rome the following remarks were made:

Ränke (Munich) can report no good result from the use of antitoxin.

Malinówski (Warsaw) knew of no bad result from the use of the remedy.

Baginsky (Berlin) believes that a positive conclusion in regard to the "heil-serum" can be reached only after some years.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

ASSISTED BY

G. G. DAVIS, M.D., M.R.C.S., AND ELLWOOD R. KIRBY, M.D.

Modification of Litholapaxy in Cases of Enlarged Prostate.

Chismore (*Journal of Cutaneous and Genito-Urinary Diseases*, August, 1894, p. 325) advocates the following modification of Bigelow's method of operating for stone in the bladder when the prostate is enlarged:

(1) Substituting local for general anesthesia in cases where an anesthetic is required.

(2) Short sittings. Continue crushing only so long as fragments can easily be found. Wash out the pieces, and stop the moment symptoms of exhaustion, spasm of the bladder, or undue distress occur.

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(3) Remove remaining pieces after symptoms due to previous operation have subsided so soon as they can be felt by the searcher,—usually within a week,—and repeat the process until the bladder is cleared.

The author in his office empties the bladder and injects one to two fluid ounces of a 4-per-cent. solution of muriate of cocaine, and introduces the lithotrite and crusher. If there is any difficulty in finding a fragment, further procedures are ceased, and the bladder washed out with warm boracic solution until the fragments cease to come. The patient is then sent home, with orders to keep quiet and warm, send for the operator if needed, and if all goes well to come back in three or four days. He has had 52 cases. The youngest was 51 and the oldest 74 years, an average of 66.36 years. Of the stones, 22 were phosphates, 24 oxalates, 5 urates, and 1 mixed oxalates and urates. The smallest weighed, when dry, 7 grains, and the largest 1000 grains; average 149 grains. There were no deaths and no serious complications attributable to these operations.

The author concludes that, in all cases of stone in the bladder where senile enlargement of the prostate gland exists, the operation described affords a reasonable probability of success, provided the urethra is, or can be made, large enough to admit the instruments; that in such cases it is possible by this method, with less suffering and danger to the patient, to remove any stone that can be gotten through a perineal incision; that the results are quite as good, both as to relief or recurrence, as those obtained by cutting, either high or low, and that, as a rule, the time required to clear the bladder is not greater than that which is necessary to recover from a suprapubic lithotomy.

[In the surgical abstracts of the August issue, p. 779, is a case of death from cocaine reported by Reclus to the Paris Société de Chirurgie, and recorded in their Bulletin of May, 1894, p. 276. In this case, to facilitate catheterization, twenty grams (five fluid drachms) of a 5-per-cent. solution, (fifteen grains) of cocaine, were injected into the urethra. Reclus stated that one should never exceed fifteen to twenty centigrammes (two and a half to three and a third grains) of cocaine at an injection, and not use a stronger solution than 1 per cent. Three other deaths are cited. In the discussion which followed, Bazy stated that the passage of the drug into the bladder favored absorption. Sée suggested slight tears in the canal might have contributed to the fatal effect, while Tuffier attributed it to the direct passage of the solution into a ruptured vein in the vicinity of the bulb. A well-known death occurred some time ago in this city from a urethral injection of cocaine.—Ed.]

Splint for Fracture of the Humerus.

Albers (*Centralblatt für Chirurgie*, 1894, p. 593) describes his method of treating fracture of the humerus with a plaster bandage. It is best applied when the patient is seated on a chair. Two rolls of a plaster bandage four metres long and twelve centimetres wide are needed.

The arm is placed parallel to the side, and the forearm flexed at a right angle, and in a supine position. The parts are slightly greased to prevent the plaster from sticking. The plaster bandage having been moistened in water is applied up and down from the neck and outer side of the arm and forearm to the knuckles. When eight or ten layers have been applied they are fixed in place with a bandage which encircles the arm and then goes around the neck and through the opposite axilla. The part of the plaster bandage on the neck which projects above the muslin bandage is turned down over it like a collar, whence the name collar bandage. The arm is placed in a handkerchief sling (Mitella), and when dried the splint is re-

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moved, trimmed, and replaced with a light layer of cotton between it and the skin. The splint is bandaged to the arm with muslin or flannel bandages, turns being taken over the shoulder and through the opposite axilla. A sling is then added. Ten patients were so treated. The average time of consolidation in eight of these cases was twenty-two days, only one went over four weeks.

Technique of Making Urethral Injections.

Guiard (*Annales des Maladies des Organes Génito-Urinaire*, June 1894) gives the results of his investigations concerning the urethra and its medication. The capacity of the urethra had been stated by Jarnin and Leprévoct to be from five to eight grammes, therefore it was held that a urethral syringe should not hold more than five or six grammes, equal to about one and a half drachms. Later it was shown that posterior urethritis, particularly late in the disease, was far more frequent than formerly supposed. The author by experimenting on the living subject found that the urethra would always hold eight to ten grammes (two to two and a half fluid drachms), and more often twelve to fifteen grammes, and sometimes sixteen to seventeen. As the patient could tell when the sphincter was forced, this was avoided. These deep injections are only called for when definite symptoms have already demonstrated that the posterior region of the urethra is already affected.

In order to administer these deep injections, the author uses a syringe of twenty grammes (five drachms) capacity. When it is desired to overcome the sphincter, gentle pressure is made when the liquid will enter. In an experience of ten years he has never had any accidents, and only encountered one case in which the sphincter would not relax. It is better to give the injections when the patient is lying down than when he is standing up. The requirements of an effective injection is that it shall reach all the diseased parts. To do this a syringe of twenty grammes (five fluid drachms) capacity should be used, and the injection of its entire contents, if carefully done, is easy, and causes no inconvenience.

Correction of Deformity after Removal of Half the Lower Jaw.

McBurney (*Annals of Surgery*, July, 1894, p. 35), after excision of a half of the lower jaw, inserted immediately after the operation an interdental splint to prevent, for the time being, its displacement by the unopposed muscles. Later a spring was inserted, one end being fastened to the divided lower jaw, and the other to the upper posterior molar teeth of the side operated on. This was soon replaced by a set of artificial teeth, with a piece of gutta-percha sufficient in size to fill out the cheek at the site of the removed bone. These appliances were made by a dentist, Dr. Westlake, from casts. The author has applied this method with success to three patients. The spiral spring is essential but a short time. During its use these patients, even the one most recently operated on, have acquired such control over the half of the jaw that they can now articulate and masticate when the spring is not in place. The essential part of the method is the application, immediately after the operation, of the simple interdental splint, and its constant use until complete cicatrization has taken place. As soon as the interdental splint is removed, and the spiral wire spring applied, the patient begins at once to cultivate the muscles, and rapidly acquires voluntary control of the jaw.

[This subject has been worked up by some of the French surgeons, and a communication appeared in reference to it in one of their journals a year or so ago.—G. G. D.]

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Treatment of Gangrenous Hernia.

In the *Bulletins et Memoires de la Société de Chirurgie*, xx, p. 381, is given a discussion on the treatment of gangrenous hernia. Chaput having advised resection with circular enterorrhaphy, Segond, on the contrary, advised the making of an artificial anus. His three cases had all died of shock. Of eight cases in which an artificial anus had been made, four died in three or four days, and the other four in the course of several weeks, one of renal and three of pulmonary complications. In these latter cases he claims that the operation had nothing to do with causing death, and says that the septic and shocked condition of this class of patients prohibits the employment of such a long operation as circular enterorrhaphy.

Terrier said that the operation of circular enterorrhaphy, as usually practised, was too prolonged and severe to be used as a rule in this class of cases, but that Murphy, by means of his anastomotic buttons, had obtained seven recoveries in eight cases. A trial of this method was recommended.

Kirmisson agreed with Terrier that circular enterorrhaphy was difficult, long, and grave, and therefore he always made an artificial anus. This he had done with some success, having subsequently closed the artificial anus in two cases.

Championnière agreed with Segond that enterorrhaphy is long, difficult, and serious, and does not often give good results. An artificial anus is much less grave.

Chaput in closing said 80 per cent. was the mortality of artificial anus, and 30 per cent. of the remainder subsequently succumbed. He offered the following conclusions:

(1) Make the resections large in extent.

(2) Don't employ any method which narrows the lumen of the gut.

(3) Leave the intestine outside between two layers of iodoform gauze.

(4) Do not use chloroform.

Miculicz only lost 30 per cent. of his cases, Murphy had the success already stated, and Delbet also has had two successful cases.

Two Cases of Rupture of the Semilunar Cartilages of the Knee.

Lardy (*Revue de Chirurgie*, June 10, 1894) excised two semilunar cartilages for rupture. The first was in a foot-ball player, aged 34 years. While playing foot-ball, fifteen years previously, he was suddenly seized with great pain on the inner side of the left knee. It swelled rapidly, and the patient was kept abed for several months and treated for tumor albus. He had the typical symptoms of loose cartilage, which came out while walking, only to be replaced by manipulation. A hard mass could be felt beneath the skin; it appeared to engage in the articulation on movement. A transverse incision was made and the anterior two-thirds of the affected meniscus removed. Union by first intention and perfect cure.

Case two was in a man, aged 50 years. About a year previously he slipped on a stone and twisted his knee. The joint immediately inflamed. The external meniscus, when the limb was extended, could plainly be felt enlarged and prominent. A transverse incision at the interarticular line allowed the removal of the anterior two-thirds of the external meniscus. It only remained attached by a thread-like filament posteriorly. This case also resulted favorably. The author also observed another case which declined operation, and a fourth in whom the cartilage had been removed ten years previously with absolutely perfect functional use of the joint.

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Comparative Safety of Suprapubic Lithotomy, of Lateral Lithotomy, and of Litholapaxy in Young Males.

Barling (*British Medical Journal*, May 5, 1894) investigated the results of these three operations during the five years from 1888 to 1892. The inquiry was limited to six hospitals in London and six in the provinces.

Of 44 cases of suprapubic lithotomy under 10 years of age, 10 died; of 28 cases between the ages of 10 and 20 years, 5 died. Total, 72 cases, 15 deaths. Deducting 3 deaths in which either litholapaxy or lateral lithotomy had been attempted leave 69 cases, 12 deaths, a mortality of 17.4 per cent.

Of 39 cases of lateral lithotomy under 10 years, 2 died; of 20 cases between 10 and 20 years, none died. Total, 59 cases, 2 deaths. To this add 1 death from suprapubic section after an uncompleted lateral operation, and it makes 60 cases with 3 deaths; a mortality of 5 per cent.

Of 43 cases of litholapaxy under 10 years of age, 1 died; of 16 cases between 10 and 20 years, none died. Add 2 deaths from suprapubic operation after uncompleted litholapaxy, and it makes 61 cases with 3 deaths; a mortality, of 5 per cent.

The causes of death in the suprapubic operation were as follows: Four were due to shock, one of the four being an uncompleted lateral operation, and another an uncompleted litholapaxy. Two were due to infiltration around the bladder, one of these followed an uncompleted litholapaxy. Three were due to various conditions of the kidneys, pyonephrosis, hydronephrosis, and calculus. One death each occurred from pyemia, septicemia, bronchitis, and pneumonia. The author gives the following results in one children's hospital: from 1870 to 1887, of 70 cases of lateral operation only 2 died, or 2.8 per cent. At the same hospital, from 1888 to 1893, 15 lateral operations were all followed by recovery, while 4 out of 7 cases of suprapubic operation died. One of these, however, followed an incompleted lateral operation. The author regards litholapaxy in children for small stones as a very facile and attractive operation, and it will probably run the lateral operation hard as the routine operation for young males. The high operation will probably be reserved for large stones unsuitable for removal by the other methods.

Sterilization of Catgut by Boiling in Olive Oil.

Eastman (*Annals of Surgery*, Vol. xx, No. 1, p. 56) experimented with the sterilization of catgut by means of hot olive oil. The following are his conclusions: Catgut can be rendered sterile by heating in oil to a temperature of 212° F. for three hours.

The method is reliable, cheap, and rapid. The quality is not impaired, and gut so treated is more satisfactory as to strength and smoothness than if subjected to the ether-alcohol-bichloride process. A higher temperature than 212° F. is not necessary for sterilization, and is an injury to the gut. The material should be wound on reels or cylinders and not on anything with sharp edges.

Device to Facilitate Micturition in Patients with Suprapubic Urethræ.

Lydston (*Journal of Cutaneous and Genito-Urinary Diseases*, Vol. xii, p. 347) suggests that, in order to avoid soiling the clothes, patients who, after suprapubic cystotomy, have some control over the urine should use a small glass funnel. The large end of this is pressed against the suprapubic opening and a small pad of absorbent cotton held beneath. By this means any little excess of urine is caught, and wetting of the clothing prevented.

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THERAPEUTICS.

UNDER THE CHARGE OF

HORATIO C. WOOD, M.D., LL.D., AND ARTHUR A. STEVENS, M.D.

THE PHYSIOLOGICAL ACTIONS OF ALCOHOL.

CERNA (*Therapeutic Gazette*, May and June, 1894) draws the following conclusions from an elaborate study of the actions of alcohol:

(1) Alcohol in small amounts excites and in large doses depresses both the peripheral motor and sensory nerves.

(2) Excessive quantities cause a spiral degeneration of the axis cylinder of nerve-fibres.

(3) Reflex action is at first increased and afterwards diminished by an influence exercised by the drug upon the spinal cord and the nerves.

(4) In small amounts the drug stimulates the cerebral functions; it afterwards, especially in large quantities, depresses and finally abolishes them.

(5) Alcohol causes lack of co-ordination by depressing both the brain and the spinal cord.

(6) In toxic doses alcohol produces hyperemia of both brain and spinal cord, especially of the lumbar enlargement of the latter.

(7) Small doses of alcohol produce increased rapidity of the cardiac beat; large amounts, a depression of the same. In either case the effect is brought about mainly through a direct cardiac action.

(8) The drug in small quantities causes a rise of the arterial pressure by a direct action upon the heart; in large amounts it depresses the arterial pressure similarly through a cardiac influence.

(9) In large doses alcohol enhances coagulation of the blood; in toxic quantities it destroys the ozonizing power of this fluid, causing a separation of the hemoglobin from the corpuscles.

(10) Alcohol in small doses has little or no effect on the respiratory function; in large amounts it produces a depression of both rate and depth of the respiration through a direct action on the centres in the medulla oblongata.

(11) The drug kills by failure of the respiration.

(12) On the elimination of carbon dioxide alcohol exercises a varying action, sometimes increasing, sometimes decreasing, such elimination.

(13) The action of alcohol on the amount of oxygen absorbed also varies, and may be said to be practically unknown.

(14) The drug lessens the excretion of tissue-waste, both in health and disease.

(15) In small amounts alcohol increases the bodily temperature; in large doses it diminishes the same. The fall of bodily temperature is due mainly to an excess of heat-dissipation caused by the drug.

(16) Alcohol, in sufficiently large amounts, has a decided antipyretic action.

(17) In moderate amounts alcohol aids the digestive processes.

(18) Alcohol diminishes the absorption of fats.

(19) The drug exercises a varying influence on the amount of urine secreted, but it probably increases the activity of the kidneys.

(20) In large doses, or when continuously used for a long time, alcohol produces cirrhotic changes, of hepatic tissues especially, and paralysis of spinal origin. It also causes insanity, epilepsy, and other maladies.

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(21) Alcohol is mainly burnt up in the system when taken in moderate quantities, but when ingested in excessive amounts it is partly eliminated by the breath, the kidneys, and the intestines.

(22) Alcohol is a conservator of tissue, a generator of vital force, and may therefore be considered as a food.

Hypnotics in Mental Disease.

Evensen (*Norsk Mag. for Laegevidenskalben*, No. 5, May, 1894) draws the following conclusions from his experiments with the various hypnotics in mental disease: *Sulphonal* was given to seventy-six patients in doses of 1 to 1.5 grammes. It was found to be very reliable, but its protracted use was sometimes followed by unpleasant symptoms. It was most efficient in acute cases,—mania, alcoholism, and active delirium. To avoid poisoning it is well to alternate it with some other hypnotic, such as chloralamide. *Amylene hydrate* is a mild hypnotic, especially useful in cerebral anemia. The sleep following its use is natural, but the drug is rather uncertain in its action. The dose is two to five grammes. *Paraldehyde* in doses of two to eight grammes, when employed for a short period, is without deleterious effects, but its continued use is sometimes followed by prostration and various nervous disturbances. *Trional* and *tetronal* are similar in their action to sulphonal. The dose of either drug is one gramme. *Chloralamide* in doses of two grammes was administered to forty-five patients. Although not very certain in its effect, it does not depress the circulation as much as chloral, nor does it often cause headache, vertigo, or vomiting. It acts favorably in senile dementia, but is valueless in conditions of great excitement. *Somnal* was employed in doses of from two to six grammes, but was very unreliable. *Hyoscine* was prescribed in seventy-six cases. Its action was prompt and reliable. When injected subcutaneously it induced sleep within half an hour, lasting five hours. It is useful in all conditions of excitement, and may be advantageously combined with sulphonal. It has little or no effect when administered by the mouth. It is harmless in doses under a milligramme. Its long use, however, is followed by cachexia. *Duboisine* in doses of one milligramme resembles hyoscine in its action, although it is less powerful. It sometimes causes hallucinations of sight.

Trional in Delirium Tremens.

Bellamy (*New York Medical Journal*, No. 60, 1894) reports twenty-five cases of alcoholic delirium in which trional was used with advantage. The adjunct treatment consisted in the employment of a hot bath, a calomel purge, and in all cases forced feeding, the diet including milk, eggs, and soup. On admission twenty grains of trional mixed in water, with ten minims of tincture of capsicum, were administered. If the delirium still continued, ten grains more of trional were given in thirty minutes, and if this proved ineffective, twenty grains additional were given in an hour. In nearly every instance sleep followed the administration of fifty grains, and the pulse and respiration were stimulated. The author concludes as follows:

(1) Delirium was controlled with greater rapidity and safety by trional than by other hypnotics.

(2) In the majority of cases a marked stimulant effect was observed, possibly on account of the methylic and ethylic elements whic henter into the composition of the drug.

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(3) On account of the low temperature noted in all cases, trional must possess antipyretic properties, thereby simulating its allies of the phenol group.

(4) It was always well borne by the stomach, and in one case was rapidly absorbed when administered *per rectum*.

(5) No unpleasant after-effects were observed.

Strychnine in Weak Labor-Pains.

Duff (*Wiener Medicinische Presse*, No. 35, 1894) has obtained excellent results with strychnine as a prophylactic remedy in weakness of the uterine contractions attending parturition. When there is general debility, or a history of post-partum hemorrhage, or of feeble uterine power, he begins to administer strychnine six to eight weeks before the expected time of parturition. Up to the last week the dose prescribed is one-sixty-fourth of a grain thrice daily, during the last week this amount is increased to one-fortieth of a grain.

The Therapeutic Uses of Sparteine.

Cerna (*New York Medical Journal*, May 26, 1894) concludes from his own experience, and from a careful review of the literature of the subject, that sparteine is a medicament of considerable power as a cardiac and renal stimulant, second only, it appears, to digitalis. The drug does not produce, as a general rule, any serious ill after-effects. It is best given by itself, though it may be advisable sometimes to administer it in combination with other remedies. Julliard calls attention to the fact that sparteine and sodium iodide are incompatible. Another important point is that of dosage. In this matter authors differ materially. Sée puts down the dose as two grains a day; Prior, from one-sixth to one-third of a grain several times daily; Tyson employs one-fourth of a grain every two hours, or one-half of a grain every four hours; Clarke gave it in amounts of one-sixteenth of a grain every four hours, and increased it to twelve grains a day without causing toxic effects. The writer believes in an energetic method of administration, using in some instances as high doses as one-half of a grain every three hours. He believes that large quantities must be used in order to insure the good effects of sparteine; small doses generally leading to disappointment.

Malakin.

Germani (*Gaz. d. Ospedal*, July 24, 1894) reports eight cases of acute articular rheumatism in which malakin acted very favorably. He concludes that it is a useful antirheumatic remedy; that it is an excellent complement of the salicyl compounds, being unattended by the disadvantages of the latter preparations; that it has marked antipyretic properties, but is less powerful than antipyrin or antifebrin; that as an antineuralgic malakin is sometimes serviceable in sensitive subjects, but that generally it is much inferior to the older analgesics,—antipyrin and phenacetin.

Ferratin.

Germain Sée (*Presse Méd.*, August 25, 1894), in a communication to the Académie de Médecine, states that even after prolonged use ferratin causes neither gastric nor intestinal derangement in men or animals. It acts as a slight astringent without causing injurious stimulation, and it never causes the development of

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H_2S as the result of putrefaction in the intestine. Its local effect on the gastro-intestinal tract shows itself constantly in restoration of appetite and improvement in the quality of the stools. It is absorbed slowly, but animals weighing from five to seven kilos. have had to take from five to twenty litres of milk in order to absorb the same quantity of iron as could be conveyed in one-tenth to two-tenths gramme of ferratin. The dosage should be so regulated that the intestine shall always contain an excess of ferratin, which the organism can use according to its needs. There is no reason to fear the accumulation of an excess of iron in the organs; absorption and elimination appear spontaneously to balance each other. Ferratin is, therefore, in the first place, an alimentary substance, and can be employed in men apparently healthy, or in children and chlorotic subjects, as the curative action is not interfered with by injurious secondary effects, as is often the case when ordinary ferruginous preparations are used. The dose of ferratin is from five centigrammes to one and a half grammes two or three times a day. Each dose contains about 7 per cent. of iron.

Antipyrin as a Vesical Analgesic.

Vigneron (*Annales des Maladies des Organes Génito-Urinaires*, No. 5, 1894) is convinced from its employment in three cases that antipyrin will prove to be a valuable vesical analgesic. Injected into the bladder the remedy is free from harmful effects, even when employed over a protracted period. As an antiseptic the author believes it to be superior to solutions of boric acid. When the solution of antipyrin is allowed to remain in the bladder, it not only relieves the pain but checks spasmodic contractions. A 4-per-cent. solution left in the bladder for ten minutes is sufficient to diminish the pain attending subsequent washing or instillation. Antipyrin may be employed in all cases of cystitis in which local treatment induces pain. When the bladder is not distended, two and a half to five drachms of a 4-per-cent. solution, left in the bladder for ten minutes, is sufficient. When the bladder is much distended, fifteen to thirty drachms of a 1- or ½-per-cent. solution should be injected and allowed to remain in the bladder.

OBSTETRICS.

UNDER THE CHARGE OF

BARTON COOKE HIRST, M.D.,

ASSISTED BY

RICHARD C. NORRIS, M.D., AND FRANK W. TALLEY, M.D.

Erythema after Three Successive Deliveries.

Gaertig (*Centralblatt für Gynäkologie*, No. 30, 1894) reports three labors in the same patient, all followed by severe erythema, although antiseptic precautions were taken. No intra-uterine injections were used. The first confinement occurred when the patient was 26 years old. The child presented by the breech. Delivery was followed by post-partum hemorrhage; the placenta was adherent, and had to be detached under chloroform. On the third day an erythematous rash

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set in, first appearing on the abdomen and spreading over the extremities. Itching was intolerable. There was neither sore throat, nor albuminuria, nor fever.

One year and seven months later the patient was again confined. The placenta was again adherent and extracted as in the previous confinement. Very severe flooding occurred. On the following night the rash appeared again, accompanied with high temperature, but no sore throat nor albuminuria. The eruption became severe over the entire body, vesicles developed at some points, and recovery was slow; the patient became very enemic from the flooding.

The third delivery occurred sixteen months after. The period of pregnancy had passed uneventfully. She was delivered of a large, healthy, male child, and a similar post-partum hemorrhage and adherent placenta complicated the labor. Two days after the erythema appeared, and upon the abdomen as before. It spread to the legs and arms. The patient recovered at the end of nine days. On this occasion there was no fever. Gaertig insists that both erysipelas and scarlet fever must be excluded even in the second attack where fever alone occurred.

Uterus Septus; Six Pregnancies.

Tarnier (*Journal des Sages-Femmes*, March 16, 1894) has under observation a case in her sixth pregnancy, whose previous history is as follows: First pregnancy, live child delivered in seventh month; it died in a few minutes. Second delivery at beginning of seventh month; child lived three months. Third delivery in seventh month; child is living. Fourth delivery at term; child lived six months. Fifth pregnancy (twins); abortion in the fourth month. The patient was sent into Tarnier's wards in the sixth month of her sixth pregnancy. Flooding had set in, and placenta previa had been diagnosed. Vertex presentation was discovered, and the fetal heart-sounds were audible. There was prolapsus vaginæ. A thick ridge ran down the anterior vaginal wall. A prominent swelling could be felt in the left fornix, which had been taken for placenta. On careful exploration a distinct opening was detected in it. The finger could pass nearly one inch up this orifice, which was separated by a distinct septum from the dilated os of the pregnant half of the uterus. Next day a clot was expelled from the non-pregnant cavity, and it as rapidly contracted. The pregnancy continues. In short, the flooding was simply menstruation continuing in the non-pregnant half of the uterus. Tarnier suspects that many cases of menstruation continuing during pregnancy can be explained in this way. When the vagina is double as well as the uterus, diagnosis will be difficult. Tarnier was once called in by a colleague to see a patient in labor. The cervix seemed like that of a non-pregnant uterus. At the consultation the vagina was found to be double, and a well-dilated cervix was discovered. The same observer has seen pregnancy alternately in the right and left half of a double uterus. The non-pregnant uterus appeared like a cyst. Twin pregnancy in one cavity and simultaneous pregnancy in both cavities of a double uterus have been recorded.

Symphyseotomy in Private Practice.

The feasibility of performing symphyseotomy without special apparatus or trained assistants is shown in the report of a case by Wallich (*Annales de Gynécologie et d'Obstetrique*, August, 1894). The patient was 32 years of age, V-para, under medium height, and stout. She gave no history of rachitis, nor were there physical signs of such disease. In her first pregnancy she was delivered at term of a living child, weighing 1750 grammes, after twelve hours labor. The second

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pregnancy terminated in a miscarriage at two and a half months. In the third pregnancy she was delivered spontaneously of a living child, weighing 2250 grammes, after a labor lasting two and a half hours. Her fourth labor was instrumental, the forceps being applied after forty-eight hours at the superior strait. The child, weighing 3300 grammes, lived. The present labor had existed twenty-four hours when she was seen by Wallich, the dilatation being at that time about the size of a five-franc piece. The membranes then ruptured, and the amniotic liquor was noticed to be greenish in color, the heart above the brim, and showing no tendency to descend.

On the following day the patient was again seen by Wallich, and found very excited, the pains vigorous, and the fetal heart-sounds good. The fetus was presenting by the vertex with Naegele's obliquity. The anterior aspect of the sacrum was accessible, but the promontory could not be reached on account of the fetal parts. Three hours later, the dilatation being complete, the patient was placed in the obstetrical position upon a case of drawers. Two physicians, a nurse, and the husband assisted the operator. The patient was anesthetized and forceps applied under antiseptic precautions upon the head still above the pelvic brim. Not securing descent after his first effort, Wallich performed symphyseotomy at once. The cartilage and subpubic ligament were divided while the forceps was in position. The pubic bones separated four centimetres at once, and during traction upon the resisting head separated five and a half centimetres. The head readily descended, was delivered living, and weighed after extraction 3810 grammes. The placenta was next extracted, and an intra-uterine douche administered.

During the delivery of the placenta and the douche the wound had been plugged with iodoform gauze. This was removed and the edges sutured when the pelvis was encircled with a plaster-of-Paris bandage. During the night the patient was left upon the chest of drawers. Next day she was removed to her bed. Scrupulous cleanliness and antisepsis were practised, the wound being dressed twice a day, while the external genitals were douched after every micturition and defecation. On the eighth day the deep sutures were removed, and on the following day the superficial ones. The plaster-of-Paris belt was removed on the thirteenth day. On the twentieth day the patient was able to rise, and walked without pain. The child was suckled from the first, and six weeks after the operation both were flourishing. The sacro-subpubic diameter was found to be 10.7 centimetres. The promontory was very high. The fetal head measurements were as follows: Biparietal, 9.4 centimetres; bitemporal, 18.2; suboccipito-bregmatic, 9.9; suboccipito-frontal, 11.6; occipito-frontal, 12.1; occipito-mental, 14.

The operation was indicated by Naegele's obliquity, the volume of the head, and the contraction of the pelvis. Wallich thinks that persistent attempts at extraction with forceps would have injured the child's skull.

Lactation; Atrophy of the Uterus.

Engström (*Centralblatt für Gynäkologie*, No. 38, 1894), referring to the simple general anemia common in lactation, especially if protracted, states his belief that this accounts for the overinvolution of the uterus, or practically uterine atrophy. He is not a believer in special tropho-neurotic action of the act of suckling on the pelvic organs. That function, he claims, does not set up contraction of the uterine fibres, and consequent absorption of its tissues.

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GYNECOLOGY.

UNDER THE CHARGE OF

WILLIAM GOODELL, M.D., AND CHARLES BINGHAM PENROSE, M.D.,

ASSISTED BY

WILLIAM A. CAREY, M.D., AND H. D. BEYEA, M.D.

SENILE ENDOMETRITIS.

A. J. C. SCENE (*American Journal of Obstetrics*, April, 1894) considers this condition quite different from the endometritis of early life. While in some cases it probably is a continuation of an inflammation which existed prior to the menopause, it is not so in the majority of cases. The disease may be limited to the cervical canal, but usually it includes the entire mucosa. It is usually suppurative, the discharge being sero-purulent, and when it begins as a catarrh it usually progresses to the suppurative form. The epithelium of the endometrium becomes almost entirely lost; granulations of low vitality spring up; minute extravasation of blood are seen with small pigment spots, atrophy of the muscular tissue was present and caused inversion of the mucous membrane; laceration of the cervix frequently existed; stenosis of the internal or external os was often present; pus would be discharged and again accumulate. When the disease had existed long enough to destroy the mucous membrane it might end in cicatrization, but it could scarcely be called self-limiting. Displacement, laceration of cervix, and a continuance of endometritis existing from early life are some of the causes of this tribute. Inattention to cleanliness, also fibroma, may cause it. The treatment consists of the use of the douche of the solution of borax or sulphate of zinc if the inflammation is confined to the cervix. Medicated tampons, astringent and alterative applications are helpful, but no caustics. Iodoform applied in the uterine cavity is very efficient, but its odor is objectionable. Complete closure must be overcome when it exists, and dilatation and drainage performed. Dilatation must be done gradually by graduated dilators. The complete removal of the uterus may be justified after other measures have been tried and failed, and when complete prolapsus exists vaginal hysterectomy is the proper treatment.

ENDOMETRITIS OF THE MENOPAUSE.

JACOBS (*Archives de Tocologie et de Gynekologie*, November, 1893) describes the pathological steps in this process as an arterio-sclerosis, followed by a diffuse sclerosis, causing atrophy of the unstriped muscle-fibre, which gradually becomes absorbed and replaced by fibro-cellular tissue. The uterine mucosa diminishes in thickness after the climacteric, its cells atrophy and undergo changes in shape, and the protoplasm is occupied by fatty granules. These conditions may cause an endometritis or some malignant degeneration. In endometritis the uterus is found to be hard and somewhat enlarged, with a hypertrophied, granular cervix, having swollen, everted lips. The mucous membrane of the vagina and vulva is apt to be inflamed and sensitive, and there is rectal and vesical tenesmus. The cervix is sometimes occupied by polypi which cause abundant hemorrhage.

These inflammatory disorders may have originated independently of the menopause, or may have come on at that time or soon afterwards. It is quite certain that the sudden and premature cessation of menstruation is a predisposing

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cause of inflammation, and many other causes combine to produce it, particularly if there be a rheumatic, arthritic, or diabetic diathesis. The symptoms of this condition are at times quite misleading, and cause mistakes to be made in favor of cancer, from the fact that the general health deteriorates quickly, and there is in some cases a fetid discharge alternating with hemorrhages, which may become alarming.

The fetid discharge of the endometritis is due to the fact that the leucorrhea is discharged slowly and has difficulty in escaping, and thus has time to decompose. The discharge is muco-purulent, while in carcinoma it is serous, limpid, and abundant. Hemorrhages are the rule in carcinoma, while in endometritis the bleeding is infrequent. The pain in endometritis may be quieted by rest, whereas everything fails to quiet it when due to cancer. Endometritis may last for years with continued local and general aggravation of the symptoms, which, of course, would not obtain in cases of malignant disease. The characteristic induration of the cancerous cervix is absent in endometritis. The vegetations on the cervix in papillary cancer are soft and bleed readily upon the slightest touch, while the hypertrophied cervix of endometritis is somewhat elastic. In certain cases the diagnosis can be made only through the aid of the microscope. In reference to treatment, the author's advice is to pay particular attention to the upbuilding of the general health, after thoroughly curetting the endometrium, which should be followed by rational local treatment.

The Advantage of Atmospheric Distention of the Rectum, with Dislodgement of the Small Intestines, in the Bimanual Examination of Uterus, Ovaries, and Tubes.

Howard A. Kelly (*American Journal of Obstetrics*, May, 1894) suggests a procedure for overcoming the embarrassment experienced by the crowding of the small intestines down into the pelvis and the consequent liability of making a false diagnosis of pelvic disease. Coils of small intestines in the pelvis containing fluid often feel tense and fluctuating, and thus readily impose themselves upon the examiner as large cystic ovaries, or leave him in doubt as to their true nature. The complete removal of these impediments may be satisfactorily effected in the following manner: The patient is placed in the knee-breast posture, with shoulders on the table and hips high and thighs vertical. The anal orifice is opened by a small speculum or tube, allowing the air to rush into the rectum. The explanation of this phenomenon is that, upon assuming the knee-breast posture, the small intestines gravitate along the anterior abdominal wall into the upper abdomen towards the diaphragm, creating a suction at the most elevated portion, which is the pelvic extremity, by means of which the whole ampulla and rectum balloon out with air as soon as the anus is opened, and the distended rectum applies itself broadly over the posterior surface of the uterus and left broad ligament. Before making such an examination, both rectum and bladder must be thoroughly emptied. Immediately after filling the rectum with air the tube is removed, the patient placed in the ordinary dorsal position with limbs flexed upon the abdomen, and the bimanual examination made per rectum and abdomen. The index finger introduced within the anus experiences at once the sensation of entering a large cavity filled with air, in which the customary resistance is absent. The communication with the upper bowel between the utero-sacral folds is, under these circumstances, readily found, and the finger is conducted behind the broad ligament, when, on using the outside hand in assistance, uterus, broad ligaments, ovaries, and tubes are at once palpated directly through the rectal wall, without resistance and with startling

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distinctness. The true pelvic viscera thus seen, as it were, to be skeletonized in the pelvis, lying so clearly exposed to touch that the minuter surface peculiarities, fissures, and elevations, and changes in consistence, can be detected, and a diagnosis made more satisfactorily, more rapidly, and with far less effort than under ordinary conditions.

Perivaginitis Simplex

J. J. E. Maher (*Medical Record*, March 31, 1894) gives the above title to a condition which he considers a new disease of the vagina. The patient was 23 years old, married one year, and had been delivered of her first child nineteen days before the author saw her. He was called on account of "puerperal hemorrhages and painful sitting." The bowels were liquid and very offensive, and had been moved daily since the third day after labor. The patient's temperature was 100° F., pulse 120, and skin clammy. She was pale, weak, and had an anxious, worried expression. There were restlessness, insomnia, painful sitting (as though she were sitting upon an apple), and a disagreeable succession of liquid in the pelvis on moving suddenly in the horizontal position, with a discharge of blood from the vagina on assuming the erect posture. The physical signs are thus described: The entire perineal body possessed a brawny hardness and was lacerated about a centimetre. The laceration presented thickened, everted, indurated lips that could not easily be approximated. The labia in coaptation presented nothing unusual; but when separated, the visual field beyond was astonishing. The vagina formed a rigid tube, all agape, with the cervix and os uteri distinctly visible at its upper end. One would have thought an invisible speculum held the walls of the vagina apart. The mucous membrane was apparently unaltered. Pressure on the perineum caused pain and was identified with the painful sitting. The same pain was produced by pushing the uterus towards the vulva; but the uterus could be pressed into other quarters without causing any pain.

Exploration per rectum discovered a fecal tumor which was pressing upon the uterus, chiefly on the cervix. This was removed and was excessively fetid. The uterine cavity was gently curetted, following which the bleeding ceased and the laceration of the perineum was treated as an ulcer by the placing of glycerin tampons. No speculum was required for these manipulations as the vaginal walls were rigid and separated. Three days later the vaginal walls had collapsed at the upper end to such an extent as to almost hide the cervix from view. The remainder of the induration melted away in a few days and the patient gradually convalesced. The etiology of the disease, in this case at least, can be apprehended and demonstrated only on the assumption that the fecal mass existed before delivery, and that the child's head was forcibly dragged over it. This mechanical extreme distribution of either the rectum or vagina, considered separately, might be easily regarded as within the scope of the functional laws of either organ, and thus be reckoned as within physiological bounds; but if it is possible for either organ to be distended beyond the natural limit, the distention of the two organs synchronously rarely exceeds the restrictions of physiology and enters the domain of pathology. The recto-vaginal cellular tissue becoming overstrained and being subjected to the infecting influences of the decomposing fecal mass, is overstimulated in the process of repair. The ensuing proliferative exudation, exceeding the normal limits of repair, spreads to the contiguous elements surrounding the vagina, induces thickening to a remarkable degree, and thus establishes the inflammation under consideration.

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PATHOLOGY.

UNDER THE CHARGE OF

JOHN GUITÉRAS, M.D.,

ASSISTED BY

JOSEPH McFARLAND, M.D.

THE CULTIVATION OF THE GONOCOCCUS, AND ARTIFICIAL GONORRHEA.

TURRO (*Centralblatt für Bakteriologie und Parasitenkunde*, July 2, 1894, Vol. XVI, No. 1) in an important paper comprehends the following three subjects:

(1) *The Cultivation of Gonococci in Acid Culture-Media.*—Gonorrheal urine is alkaline, but speedily becomes acid when the contained pus sediments. Turro noticed that when such urine is placed in the incubator for twenty-four hours, the clear supernatant fluid contains an almost pure culture of gonococci, while the sedimented pus is in a part of the liquid where luxuriant growths of streptococci and other bacteria take place. This is described as dependent upon the acidity of the urine, for it is said that as soon as the urine is neutralized the growth of gonococci ceases. The vegetative value of the urine for gonococci can also be much improved by the addition of ½ per cent. of Catillon's peptone-powder,—provided the acid is not neutralized. Fresh sterilized urine, with or without the addition of peptone, makes an excellent culture media for the gonococcus. The gonococcus also grows well in 10 per cent. gelatin, if acid, especially if ½ to 1 per cent. of peptone is added. The growth appears as a white line, never associated with liquefaction. Plate cultures are perfectly characteristic. The colonies appear as white points, which later elevate themselves like ivory hemispheres above the surface of the gelatin.

The gonorrheal pus is a powerful poison for the gonococci, causing cessation of growth and involution forms. Pus twenty-four hours old does not grow any better upon acid gelatin than upon neutral or alkaline, so that for the cultivation of the organism absolutely fresh pus must be selected from new cases.

It is to be observed that the rapid development of alkalinity following the growth of the gonococcus is an aid to the contamination of the culture by allowing the development of such streptococci, etc., as grow best in alkaline media.

(2) *Artificial Gonorrhea.*—Gonococci cultivated in acid media, as described, unlike those cultivated in neutral or alkaline media, are highly virulent for dogs. Such is the peculiarity of the virulence of this organism that neither an injury to the mucous membrane of the urethra, nor actual introduction into the urethra are necessary for the production of the disease. All that is required is that the culture used for inoculation be touched to the meatus urinarius. It is, in fact, the only microbe capable of causing disease and entering the body without any breach of tissue continuity.

(3) *Microscopic Examination of the Gonococcus of Dogs.*—The organism appears as a diplococcus, which absorbs ordinary dyes like a sponge, but immediately decolorizes when treated with iodide of potassium, iodine, and alcohol. Its size and, indeed, all its peculiarities are identical with the gonococcus of Neisser.

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The Injection in Pneumonia and Typhoid Fever of Serum from Convalescents.

Hughes and Carter (*Therapeutic Gazette*, June 15, 1894), following the line of experimentation suggested by the Klemperers and others, injected fourteen cases of pneumonia and three of typhoid fever with the serum obtained from patients convalescent from the same disease. All the cases from which the serum was obtained were carefully selected, and of unquestionable diagnosis. All the cases of pneumonia exhibited numbers of pneumococci in the sputum, the virulence of these organisms always being tested. It would be expected that cases treated in the same manner with serum from such cases as described, none of them being more than two weeks past the crisis, would give results of comparative uniformity. Such, however, was not the case. Some showed success, others decided failure. Of ten selected cases only five can be claimed as distinctly proving any success due to the immune serum. In one case crisis followed the injection, but was probably not due to it. In three of the cases where no effect was produced, the failure is explained by the fact that one of them was a negro (in the negro's sputum the diplococci seem to be distinctly more virulent than in the sputum of a white man, the same probably being true of the lungs, where a larger dose of the antitoxic serum would be required); in another the pneumonia proved at autopsy to be of a peculiar character, more resembling broncho- than lobar pneumonia; while the last case remained inexplicable.

The lack of action of the immune serum in certain cases is ascribed to

(1) A duality of diplococci causative of pneumonia.

(2) Variation of the toxines. The toxines, however, are constant concomitants of the growth of bacteria, and while under differing conditions of inherent qualities or environment, it is possible that the toxines are secreted in varying proportions, yet it is not likely that the average proportions would ever be so rudely disturbed as to lead to total failure of a neutralizing agent to act. The toxines must always be the same, therefore this hypothesis is not to be entertained.

(3) The inadequacy of the antitoxic theory. Neutralization of the toxines is not necessarily cure. Neutralization is merely a step in the production of immunity, and its causes must be sought deeper down. While, therefore, it cannot be doubted that immune serum may have a most pronounced effect, yet the irregularity of its action certainly suggests strongly that there are important factors other than the antipneumotoxine concerned in the production of the crisis, and the subsequent immunity,—factors probably to be found in some condition of the cells rather than that of the blood serum.

From a therapeutic stand-point the results were disappointing. In the ten cases where perfect serum was used there were three deaths,—about the ordinary death-rate from pneumonia. While disappointing, they are harmless, no bad effects following them.

Three cases of typhoid were tried, all recovering in an unusually short time, but as all the experiments were made upon very mild cases, it is difficult to estimate the value of the serum-therapy.

The Manufacture and Use of the Diphtheria Antitoxine.

Ehrlich, Kossel, and Wassermann (*Deutsche medicinische Wochenschrift*, April 19, 1894, No. 16). For the preparation of diphtheria antitoxine these experimenters prefer the goat to all other animals, because of the considerable natural resistance which the animal shows to the disease. The goat is first rendered immune by the injection of increasing quantities of *dead* diphtheria bacilli, until

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it becomes accustomed to the toxines, and is able to overcome them. When this condition is developed gradually increasing doses of *live* bacilli are injected, until considerable quantities of exceedingly virulent cultures can be tolerated without injury.

In order to have a definite standard by which to judge the value of the goat's serum as an antitoxic, the investigators made use of the discovery of Behring and Kitasato, that when the micro-organismal toxines and antitoxines are mixed in a test-tube, the proper relative amounts produce a neutral compound devoid of toxic properties. Most previous observers making use of the antitoxic principle injected it simultaneously, but separately, into the control animals. Ehrlich, Kossel, and Wassermann, however, observed that when this is done considerable time elapses before the antitoxine circulating through the system is able to act upon the toxine, thus being an inferior method of its employment to the mixed solution.

In order to obtain a standard toxine, ½ per cent. of phenol is added to an old bouillon culture of the diphtheria bacillus. A toxine so virulent may be thus obtained that in doses of 0.3 per 1000 grammes of body weight, it is constantly fatal.

The value of the antitoxine is determined by the addition of 0.4, 0.3, 0.2 grammes of the serum from the prepared goat to the *dosis lethalis* for a guinea-pig, diluting the mixture to four cubic centimetres, by adding physiological salt solution, then injecting it into guinea-pigs. Upon the next day the occurrence or absence of induration at the seat of inoculation, as well as the consideration of the weight of the animal, must be the key to the amount of the antitoxine necessary to neutralize the toxine.

Ehrlich found that the antitoxine is present in the milk as well as in the serum of the goat, but that a relatively greater quantity of it must be used to neutralize the toxine.

Two hundred and twenty children, in various Berlin hospitals, were subjected to the antitoxine treatment, the results being such as to indicate a distinct value of the serum-therapy. It is essential that the cases chosen for treatment shall be in the early days of the disease, as less improvement was observed in old than in fresh cases.

MISCELLANEOUS.

FOR THE SCIENTIFIC STUDY OF APPENDICITIS.

At the last meeting of the Board of Managers of the University Hospital the Director was authorized to set aside certain beds to be used by Professors William Pepper and J. William White for cases of appendicitis, those gentlemen being engaged in a special investigation of the symptoms, treatment, and pathology of that disease. Each case admitted to these beds will thus be studied from the outset with reference to both its medical and its surgical features. It is hoped that the results may aid in clearing up the prevalent differences of opinion as to this malady.

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CORRESPONDENCE.

Editors of UNIVERSITY MEDICAL MAGAZINE:

DEAR SIRS: For the purpose of securing reliable statistics on the subject of the marriage of syphilitics, I desire to enlist the assistance of those of your readers who have had experience which will be of value in determining the period when this disease ceases to be communicable and inheritable. I shall therefore esteem it a great favor on the part of any physician who will send me answers to the following questions, and due credit will be given in a future publication to those who desire to aid me in this work.

(1) What is the latest period from the date of the initial lesion that you have known the disease to be communicated by a patient who has been from the first under your observation?

(2) What is the latest period from the date of the initial lesion that you have known: (*a*) a syphilitic man, or (*b*), a syphilitic woman to become the parent of a syphilitic child?

(3) Have you ever known syphilis to be either communicated or handed down at a later period than four years from the date of initial lesion by an individual who has been constantly under your observation during that time?

In answering these questions I should like a brief but complete history of each case, and an account of the treatment that has been pursued.

I hope by this means to obtain the experience of a large number of observers, and to reach a fairly reliable conclusion as to the time when we may safely permit our syphilitic patients to marry.

Yours very truly,

BURNSIDE FOSTER, M.D.

LOWRY BUILDING, ST. PAUL, MINN.

BOOK NOTICES.

A SYSTEM OF GENITO-URINARY DISEASES, SYPHILOLOGY AND DERMATOLOGY. By various authors. Edited by PRINCE A. MORROW, A.M., M.D., Clinical Professor of Genito-Urinary Diseases in the University of New York, etc. Vol. III. Dermatology. New York: D. Appleton & Company, 1894.

This, the concluding volume of Dr. Morrow's system, fully maintains the general excellence of the two which preceded. The work is

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devoted entirely to dermatology, the subject having been divided between twenty-seven contributors well known in connection with this branch of medicine.

Part I is devoted to general considerations of the subject. The first article, naturally, treats of the anatomy of the skin. This is followed by a brief consideration of the physiology; both of these portions are from the pen of Louis Heitzmann and show the marks of care and thoroughness in their preparation. Semeiology has been well presented by Prince A. Morrow, and Etiology and Diagnosis by William A. Hardaway. The perplexing subject of classification has also been contributed by Dr. Morrow. Crocker's modification of Hebra's classification has been adopted, with some changes. The list will be found very comprehensive, many new diseases appearing in the table.

The acute specific eruptive fevers receive brief but sufficient notice, inasmuch as these diseases usually come to the physician rather than to the dermatologist. Hyperemias have been dropped as a separate affection and have been grouped under "inflammations." The distinction between hyperemia and inflammation is, however, maintained by "erythema hyperæmicum seu simplex" and "erythema exudativum." The division of erysipelas into "idiopathic" and "traumatic" has been also dropped, it being considered that the streptococcus of Fehleisen is the only cause of the disease. In the treatment of erysipelas, local medication is most depended upon, especial preference being given for ammonium ichthyol. The results "appear to be immediately and surprisingly beneficial."

"Erysipeloid" will be new to many readers. It is defined as an erysipeloid inflammation of the skin, which develops in a wound as the result of its infection with certain special micro-organisms found in dead or decomposing animal matter. The specific germ probably belongs to the family of the cladothrix. Rosenbach has succeeded in producing typical erysipeloid by inoculation of pure cultures. The symptoms developed usually within forty-eight hours. Erysipelas, erysipeloid, and other sections were contributed by George T. Elliot.

Furunculosis, carbunculosis, anthrax, etc., has been assigned to S. Politzer. He expresses the modern views on these subjects. It would seem, however, that some mention should have been made of the auto-inoculability of "boils," and of the value of antiseptic applications, which is not referred to, except in the cases where incision has been practised. In "hot cataplasms" the addition of an antiseptic would be valuable. In the treatment of carbuncle, the author says excision is most to be commended. The only other methods to be recommended at all are incision and parenchymatous injections. We are in accord with the statement that a poultice actually favors the spread of a carbuncle, while the use of ice is no more serviceable.

The sections on impetigo, impetigo contagiosa, ecthyma, and dermatitis herpetiformis were written by H. W. Stelwagon. The latter subject has been particularly ably treated, while the former concisely represent what is known of those diseases. Eczema is likewise exhaustively considered by H. G. Pifford, and is justly called the most important affection of the skin. Psoriasis is very satisfactorily presented by William Thomas Corlett. In this disease, arsenic was

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formerly considered the most efficient remedy, but we are now told that local treatment plays the more important part in the medication. The chapter on dermatitis medicamentosa is from the pen of the editor. No less than seventy-six drug eruptions are described.

The articles on lentigo, chloasma, keratosis, callositas, verruca, ichthyosis, scleroderma, elephantiasis, etc., by James Nevins Hyde, are worthy of praise. A prominent feature is the exhaustive bibliography following the different subjects.

We cannot pretend to have exhausted in any sense the valuable contributions of the many other distinguished authors, which is precluded by the size of the work. Suffice it to say that each one has performed his part well, and the more than two hundred subjects have received thorough consideration without the introduction of any superfluous matter. The numerous plates and chromo-lithographs throughout the book illustrate many rare and typical conditions. Dr. Morrow has accomplished the task of arranging this vast mass of material with much credit. The mechanical execution is all that could be desired. This is one of the most valuable systems that has appeared, and will doubtless remain the standard work on the subjects of which it treats for some time to come.

RECHERCHES ETHNOLOGIQUES SUR LE MORVAN. Par A. HOVELACQUE et G. HERVÉ. Paris: Librairie, Georges Masson, 1894.

The *Mémoires de la Société d'Anthropologie de Paris* are examples of the excellent work done by French scientists, shown in the comprehensive view of the field under investigation, thorough examination of the *matériel*, accurate description in detail, concise summary of results, with philosophic deductions from recorded data and practical applications for improvement.

An instance of this is the above-mentioned publication concerning the district Morvan, whose population is essentially the same as that of the central plateau of France, with which it is contiguous. The volume contains some two hundred and fifty pages, with appendices and notes, bibliographic, geologic, geographic, pre-historic, historic, linguistic. To aid in the comparative study of the Morvan inhabitants, a summary of the general ethnology of France is given, as established by a series of observations made on exhumed crania, *et al.*, during the last sixty years. From these it results that the basic race is Keltic (*alias* Gallic), to which has been added elements from the Kimric (*alias* Anglo-Saxon), a people allied to those of Indo-European speech in various lands.

Part First treats on the territorial limits of the region in question, topography, geology, flora, fauna, and its politico-economic conditions under previous *régimes*, as to the manner of living of the inhabitants, government, agricultural and commercial products, etc., with tables making known the increase and decrease in population from 1801 to 1891. The advent of the indigenous race is fixed at the fourth century, B.C., the *periode celtique*, which corresponds to the *bronze age*. A wondrous change has been brought about during the last fifty years through the opening of new and good roads. This, however, tends to

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destroy the purity of the race, by affording the natives means of egress from their mountain home, and facility of approach for those of the world outside.

The *Second Part* refers to portions of the country in detail, touching archeology, ancient ethnology, statistics of population, with descriptions of the various parts of the human body, color of the hair, eyes, —*e.g.*, as ascertained in the different localities. In *Chapter Seventh* (of this part) are remarks on physiognomy, psychology, language, and the influence of communication with foreign races in modifying this people so long isolated as regards the various phases of social life.

From numerous observations and comparisons the authors conclude that the population of Morvan, with that of France in general, has lessened as the conditions of existence were ameliorated. This seems to be explained by certain social features. In making up the ethnic diagnosis they think that the stature of the original Morvandeaux has been increased in height by the admixture of Kimric elements. Stature is generally recognized as a typical racial manifestation.

This volume contains also various illustrative maps, tables of measurements from different observers, photographs of typical faces, etc. Numerous quotations and notes show Latin of 1676, and forms of French at successive stages of evolution. The authorities given as references are both old and recent: Latin, Italian, German, Russian, in which may be found further bibliographic information.

The name Morvan (referred to in an appendix) has its origin, possibly, in *mor*, meaning *black*, and *van* or *vand*, meaning *mountain*, being thus equivalent to *black hills*. A similar country in Scotland is called *Morven;* both these languages and peoples are Keltic. However, there is a region in Eastern Russia, near the upper Volga and the Oka, whose inhabitants, of Finnish race, are called *Mordvin*. Moreover, the photographs given in this work resemble the faces of Asiatic Muscovites; and our authors state that in Morvan the equine race is almost identical with the horses of to-day on the Siberian steppes. *Tacitus* says that a people of Gaul, the Boii, passed into Italy, and thence into Germany, where they gave their name to Bohemia [v. Tacitus et Vellei]. Inasmuch as the Bohemians are a Slav race, this may be another presumptive evidence indicating the common *provenance* of Gaul and Russian, and help to explain the name *Morvan*. Under the Romans some Sarmatians (Russians to-day) were settled in Morvan. *Camper* states that he noticed a similarity in form, stature, etc., between the women of Holland and those of Oriental countries. One of the references is to a paper by *Bogdanov*, entitled, "Which is the Oldest Race in Russia?" an extract from the first volume of the Transactions of the International Congress for Archeology, Anthropology, etc., Eleventh Session, Moscow, 1892. Such things make one hesitate ere forming a judgment, and suggest a similarity of origin in the far away antiquity.

L'Esprit de critique is well exemplified by the comparisons and opinions given in various portions of the volume.

The work of Gaston Boissier and others (in the *Université de France*) may be cited as illustrative of similar productions in linguistics.

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THE JEWISH METHOD OF SLAUGHTER COMPARED WITH OTHER METHODS FROM THE HUMANITARIAN, HYGIENIC, AND ECONOMIC POINTS OF VIEW. By J. A. DEMBO, M.D., Physician to the Alexander Hospital, St. Petersburg; Member of the St. Petersburg Medical Society; Member of the Society for the Preservation of Public Health, etc. Translated from the German with the Author's Amendments. Published by the trustees of the late J. A. Franklin. London: Kegan Paul, Trench, Trubner & Co., Limited, 1894.

It cannot be questioned that slaughtering animals for food possesses considerable interest for the sanitarian. The subject has been discussed from time to time from a scientific stand-point, as well as that of personal preference, but we believe it has never before been so carefully studied, and so impartially presented. The question is considered under the following heads: (*a*) From the point of view of humanity. (*b*) From the point of view of hygiene. (*c*) From the point of view of economy. The observations are based upon the killing of nearly 4000 animals by different methods, and reveal some interesting points. The conclusion is reached that in the Jewish method of slaughter the minimum amount of suffering is inflicted, while the keeping qualities and the healthfulness of the meat are much increased. The book cannot fail to interest all who are concerned in the promotion of hygiene.

ESSENTIALS OF PRACTICE OF PHARMACY. By LUCIUS E. SAYRE, Ph.G., Professor of Pharmacy and Materia Medica in the School of Pharmacy of the University of Kansas. Philadelphia: W. B. Saunders, 1894.

This is one of the question compends, and is made to conform to the 1890 revision of the United States Pharmacopeia. Among the additions in the present volume may be mentioned the following: An Outline of Drug and Plant Analysis, Structural Formulæ of Organic Carbon Compounds used in Medicine, Pharmaceutical Testing of Inorganic Chemicals, and Problems in Allegation and Specific Gravity. The student of pharmacy will find this a useful book in reviewing the didactic and practical instruction.

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UNIVERSITY
MEDICAL MAGAZINE.

DECEMBER, 1894.

THE WORK OF THE GYNECOLOGICAL CLINIC OF THE HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA, 1893–1894.[1]

By Charles B. Penrose,

Professor of Gynecology in the University of Pennsylvania.

I have presented this paper to the college not to give a number of statistical tables and reports of cases, but because several general conclusions can be drawn from the work of the clinic, which I hope will be of interest to others than specialists in gynecology.

The cases which seem best suited for the instruction of a large number of students are those which require the operation of celiotomy, and for this reason nearly all the operations performed at the gynecological clinic have been of this character. The various plastic operations upon the perineum, the vagina, and upon the uterus through the vagina can be seen with advantage by but a few students at one time, and, consequently, all these minor operations are reserved for ward-class instruction.

Many physicians and a good many students, at first, have the impression that a clinic at which repeated celiotomies are performed presents nothing of interest beyond the mere details of the operation, and that instruction in such clinics covers only the general and special operative technique.

This is a mistake. The instruction in the operative technique of celiotomy is of very minor importance to undergraduate students; and cannot compare in value to the instruction derived by viewing, through a celiotomy, diseased structures in place, or their examination when fresh, immediately after removal. The students have an opportunity of observing the history of the patients before the operation,—in many

[1] Read before the College of Physicians, Philadelphia, November 7, 1894.

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cases of examining them in the ward classes beforehand; and after this introduction the study of the pathological specimens removed at the clinic has much increased interest and value; confirming or upsetting the diagnosis, and shedding light on all the objective and subjective symptoms which the patient had presented.

A clinic of this kind instructs in a way analogous to an autopsy. The particular technique of the operation is of value only to specialists. It is remarkable what a great variety of diseases of women are presented for study through the operation of celiotomy even in a limited number of cases. Forty-six celiotomies were performed at the clinic last winter, and these are some of the diseases which were studied: extra-uterine pregnancy, oöphoritic, paroöphoritic, and papillomatous cysts. All the various forms of ovaritis and salpingitis, tuberculosis of the internal genitals, fibroid disease of the uterus, myxomatous degeneration of the uterus, cancer of the uterus,—both of the fundus and cervix, etc.

Clinical instruction by means of celiotomy is not given at the expense of an increased mortality. The mortality, after celiotomy, in the general clinic-room of a clean hospital is not necessarily any greater than the mortality in the best-equipped private operating-room. I am aware that there is still a prejudice in the minds of many physicians against the performance of the operation of celiotomy in the general hospital clinic, but I feel convinced that this prejudice is unwarranted at the present day.

A few simple preparations will render the clinic-room as suitable for an aseptic operation as any place can be made; and the presence of a number of unsterilized medical students does no harm as long as they and their dust are kept from contact with the patient.

Infection undoubtedly takes place from contact. Infection from the atmosphere must be very rare. My series of forty-six cases, though small, still goes to sustain this view. For in this number there was no case of sepsis or peritonitis. The only death which occurred followed almost immediately after the operation from shock and hemorrhage, in an uncompleted operation for a large, densely-adherent, retroperitoneal dermoid.

The aseptic technique is very simple and easily followed. Before the clinic, the amphitheatre is scrubbed, and the railing separating the amphitheatre from the benches is covered completely with large cotton sheets wrung out of a bichloride solution. All the tables, stands, and chairs are covered in a similar way. The operator and assistants are clothed in white cotton shirts and trousers, which are washed for every clinic. Operator, assistants, and nurses are covered with large sterilized aprons. Dressings and silk ligatures are sterilized in a steam

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sterilizer, and the instruments are boiled in a solution of bicarbonate of sodium. Distilled water is used for all purposes throughout the operation.

No one is permitted in the amphitheatre except those persons who are directly engaged in assisting at the operation, and these are limited to the minimum number. The wound is usually closed with buried sutures,—of silk and catgut,—and with an intracutaneous suture of silk. By such simple means perfect asepsis can be attained.

I have found that the practical and scientific work of the clinic is very much assisted by having facilities for making bacteriological examinations on the spot during the operation. And it seems that such association of bacteriology and surgery would be of much advantage in other branches besides abdominal surgery.

In the gynecological clinic the question of drainage after celiotomy is—except in rare cases, as of suspected hemorrhage—determined absolutely by bacteriological examination of any suspicious fluid which may have escaped into the peritoneal cavity. The result so far, not only at the University of Pennsylvania, but outside, has confirmed my faith in this method.

These bacteriological examinations have shown that the pus in very many cases of pelvic abscess—of ovarian, tubal, or some other origin—contains no micro-organisms; it is sterile and harmless, incapable of producing sepsis or peritonitis. The pus containing gonococci alone, at least in limited numbers, seems also to be harmless when brought in contact with the peritoneum. The practical value of this application of bacteriology is very great. It enables us to follow a median course between the extreme advocates of drainage in celiotomy and the extreme opponents of drainage; and the course is determined not by prejudice, but by scientific reasoning. In all cases where the bacteriologist finds no micro-organisms in the purulent or other material which escapes into the peritoneum, the abdomen is closed without irrigation and without drainage. When staphylococci, streptococci, or the bacterium coli commune are found, both irrigation and drainage are employed.

The examinations are made very quickly—within five minutes—and in no way interfere with or delay the progress of the operation. It is very inaccurate to speak of flooding the pelvis and abdomen with pus and of saving the life of the woman by irrigation and drainage,—simply because a sac containing purulent-looking material has been ruptured during removal. The purulent material is only dangerous if it contains septic or pathogenic germs, and the surgeon has no way of determining this fact without the aid of bacteriological examination. Most of the irrigation and drainage which is done in a routine way without such examination is unnecessary, and consequently harmful.

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The result of the clinical experience of the past winter is to confirm my opinion of the value of the procedure of removing the uterus in many cases in which formerly we had been contented merely with the removal of tubes and ovaries. In cases of pelvic abscess it enables us to make the most complete removal of the abscess sac and to perform a neat, clean operation; and in many cases of ectopic gestation and pelvic inflammatory trouble it enables us to check hemorrhage,—otherwise very embarrassing.

In septic cases accompanied by disease of the endometrium the relief is immediate and permanent.

The operation of ventrofixation or suspension of the uterus has also given most satisfactory results in retroversion, retroflexion, and prolapse of the uterus.

A subject of special investigation last winter was that of tuberculosis of the Fallopian tubes. All the Fallopian tubes and ovaries removed for the general condition designated pelvic inflammatory trouble were submitted to a most thorough microscopical examination by Dr. Beyea, who found a large proportion of them tubercular. The number of cases is too small to warrant the assumption that this proportion will be constant in any series of similar cases. It is, however, greater than any yet reported. We found that in our series of pelvic inflammatory cases 20 per cent. were tubercular.

The tubercular process seems to begin in the distal third of the Fallopian tube, and thence to spread to the ovary and peritoneum or to extend to the uterus. The results in the tubercular cases were all good and seem to be permanent. The relief from pain was immediate, and there has been progressive increase of weight and strength.

CELIOTOMIES PERFORMED AT THE GYNECOLOGICAL CLINIC OF THE HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA.—(1893-1894.)

Hysterectomy—Intra-Abdominal Method.

	Number of Cases.
Fibro-myoma	3
Calcareous degeneration of fibroma	1
Salpingitis and endometritis	6
Extra-uterine pregnancy	1
Cancer of cervix and body of uterus	1
Myxomatous degeneration of uterus, salpingitis	1
Tubercular salpingitis, endometritis, peritonitis	1
Total	14

Ovariectomy.

Papillomatous paroöphoritic cyst	2
Dermoid cyst (retroperitoneal)	1
	3

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Salpingo-Oöphorectomy.

	Number of Cases.
Chronic salpingitis and ovaritis	6
Hystero-epilepsy	1
Tubo-ovarian abscess	2
Tuberculosis of Fallopian tubes	1
Pyosalpinx	1
Hematosalpinx	1
Hydrosalpinx	1
	13
Ventrofixation of uterus for retrodisplacement with or without salpingo-oöphorectomy	11

Celiotomy without Removal of Structures.

Tuberculosis of tube and ovary and general tuberculosis of peritoneum	1
Cancer of fundus of a double uterus	1
Epilepsy (suspected ovarian disease)	1
Papillomatous cyst of ovary, general peritoneal papilloma	1
Ventral hernia	1
Total	46

It is impossible to tabulate, in a perfectly satisfactory way, any series of cases of pelvic disease in women because we always find a variety of pathological conditions together. In the preceding series I have divided the cases according to the form of the operation, and have mentioned the most conspicuous pathological condition present.

The cases of hysterectomy for salpingitis and endometritis include those cases in which there is purulent inflammation of the Fallopian tubes, generally of gonorrheal or post-puerperal origin, with chronic purulent endometritis and a friable degenerated condition of the body of the uterus. The operation of hysterectomy is a complete removal of all diseased structures. After simple salpingectomy in these cases the woman continues to suffer for an indefinite period with a virulent form of leucorrhea,—which, if of gonorrheal origin, may not yield to any plan of treatment.

In the operations of ventrofixation of the uterus, the primary object was the correction of a retrodisplacement. If in any case there were marked tubal and ovarian adhesions, salpingo-oöphorectomy was performed. The operation of ventrofixation was always preceded by perineorrhaphy if there was present laceration or relaxation of the perineum. Drainage was employed six times in this series of cases for the following conditions:

Tubo-ovarian abscess,—where streptococci, staphylococci, or bacterium coli commune were found in the pus.

Papillomatous cyst, with infection of the peritoneum.

Tuberculosis of the peritoneum.

Extra-uterine pregnancy.

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A CLINICAL STUDY OF EMPYEMA IN CHILDHOOD.[1]

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Empyema was formerly considered rather as an accident occurring in the course of sero-fibrinous pleurisy brought about by poorly-conducted attempts at exploration or operative interference, or if found without any previous violence as caused, on the one hand, by some inherent tendency in the system of its victims towards a conversion into pus of such serous exudations, or on the other, by an acquired dyscrasia, which again predisposed to pus-formation. As its origin was shrouded in mystery, so was its prognosis uncertain and its treatment along lines which were necessarily indefinite. Now that careful bacteriological investigation has shown its true nature, we are able to discuss it more definitely and to recognize it as entirely separate and distinct from any other variety of pleurisy. While the empyema of childhood is not at all to be thought of as constituting a separate variety of the disease, yet it presents here certain peculiarities which make a special study well worth while. Disease processes are much less complex at an early age than in later life, and the actual causes of empyema existing then are much more easily and definitely determined. My somewhat elementary treatment of the subject, and a possibly prolix statement of facts already well established, may be pardoned when it is remembered how little the true nature of empyema is appreciated by the profession at large. Two points cannot be too strongly accentuated here, that empyema is much more common in childhood than is often supposed, and that it is a distinct entity, is primary, and has no direct relationship with sero-fibrinous pleurisy. Having these facts clearly in mind it becomes difficult to escape a correct diagnosis, and the diagnosis is made at a time when it will be of the most service. But, having recognized the condition, other considerations are of essential moment in prognosis, and become of paramount importance in treatment. Bacteriological study has shown that in the pus of all empyemas micro-organisms are present; these constituting the cause, at the same time serving to divide the disease into distinct varieties, the recognition of which, while not always possible, is yet of great importance. The micro-organisms concerned may be divided into three classes: pneumococci, tubercle bacilli, and pus organisms, and these produce empyemas as

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distinct in their nature and symptoms as in their etiology. The introduction of these micro-organisms into the pleural cavity takes place undoubtedly in the vast majority of instances by way of the lungs, but there is a small, yet still appreciable, number of cases where the lymphatics, or even the blood-vessels, are the pathway and the lungs are uninvolved. Even where introduction takes place immediately from the lungs the initial lesion in them may be so trifling as to be unrecognizable and thus unavailable for diagnostic purposes. The condition of the pleura would seem to be of much importance. It is certainly an open question whether a healthy pleura would not destroy any ordinary irruption of germs, and whether it is not, in most instances at least, necessary to have a previously existing abnormal state of this membrane before we can have a soil suited to the development of the specific germs of empyema. In those scattered cases where a serous effusion has spontaneously become purulent, either the germs were introduced subsequently to the pleurisy and thrown upon a soil previously fitted for them by disease, or they, in the beginning, had not sufficient virulence to produce pus, but merely a serous exudate. The first of these two hypotheses certainly seems the more tenable.

In the greater number of cases in children the pneumococcus is the causative germ. Almost of necessity introduced by way of the lungs into the pleural cavity, it is still not necessary that we should have a preceding pneumonia, though those cases which have been carefully watched from the beginning will generally be found to have thus eventuated, and in the others, the history will, as a rule, point quite strongly to an initial pneumonia. So frequent is this that it is of diagnostic importance, and will alone serve to point strongly towards a metapneumonic empyema, though microscopic examination is always necessary to an absolute determination of the variety. While the entrance of the pneumococci into the pleural cavity is probably coincident with the height of the pneumonia, yet the symptoms of the empyema rarely develop at this time, the pneumonia will run its course, there will be an interval of some days, or sometimes a week or more, during which the condition, if not wholly satisfactory, is at least such as to make us believe that the trouble has passed before the empyema begins to manifest itself. The amount of lung involved has little to do with the incidence of the empyema, often the physical signs and the trifling nature of the symptoms are such as to suggest rather than a lobar a slight broncho-pneumonia. Metapneumonic empyema being the commonest form in childhood accounts for the comparatively favorable prognosis at this age, and determines the somewhat peculiar course, as will be pointed out further on. In addition to the presence of the pneumococcus there must be another element which determines the

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incidence of empyema, for it is well known, that there may be pneumococci present when the effusion is not purulent. What this element is, is doubtful, but it must be some condition antedating the entrance of the pneumococcus, for this form of empyema is invariably acute and primary and never follows a sero-fibrinous pleurisy.

Tubercle bacilli may, unaided, produce empyema; at least in a certain number of cases these organisms, and these alone, have been found in the pus. The commonest form of tuberculous pleurisy in childhood is, of course, that in which the exudate is sero-fibrinous. It is interesting to note here that, while in the serous exudate it may be impossible to find the bacilli, and whenever they are present their numbers are few, in empyema they exist almost constantly and usually in considerable quantities, rendering the differentiating of this variety comparatively easy. This form of empyema is apparently rare in childhood, yet clinical facts lead me to believe that more careful investigation will show that it is more common than is now apparent. When it does occur it seems to be a sequence of tuberculosis of the bronchial lymph-glands, rather than of the lung, and is not likely to lead to a secondary pulmonary involvement, but to a generalized miliary tuberculosis. It is necessary to bear this fact in mind, as this form of empyema is very likely to be localized.

In the last variety, that produced by any one, or more usually, several of the pus organisms, most prominent among which are streptococci and staphylococci, we have to deal with a form whose etiology is less clear than that of either of the others, and whose symptoms and prognosis are less definite. It is possible that the organisms may, like the pneumococci, gain access to the pleura by way of the lungs, but this is here only exceptionally the case and the lymphatics are the common path. This variety is the one which usually follows the infectious fevers, resulting either from the germ, which is their cause, or from any of the numerous swarm which follows in their wake. Not at all infrequently a nidus for the germ is formed by a serous effusion, so that in this form we find best exemplified the changing of a serous into a purulent exudate. Of the predisposing causes of this variety, scarlet fever seems to be the most frequent, though it may follow any other of the fevers or, in fact, any lesion which will admit pus-producing organisms.

Finally, while I have spoken of clearly-marked varieties, yet it must be recognized that in most cases we have to do, to a certain extent, with a mixed infection where the micro-organism present in greatest numbers determines the type. It is to be doubted that even the most typical examples of metapneumonic and tuberculous empyemas are really due wholly to their respective specific germs. There is,

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probably, in all of them a *rôle* of a certain importance played by the pus organisms. However, though these organisms may play a part, it seems but a secondary one; where the pneumococci or tubercle bacilli are prominently present they determine the type of their respective varieties and have most to do with their course and termination. But whether or not we concede the existence of specific varieties, the important fact still remains that an empyema is invariably due to micro-organisms; that it is a disease in itself, and is primarily empyema or has, at least, the potentiality of becoming an empyema.

Symptoms and Diagnosis. Clinically, two well characterized divisions may be made, and the line of demarcation between them is more sharply drawn in childhood, owing to careless inattention to symptoms on the part of the parents, and to the fact that children are not acute observers of their own physical condition, or too young to give expression to symptoms which would attract attention to their ailment. It is this very fact that a serious disease in childhood so often lacks expression, that should suggest the possibility of the occurrence of empyema, when conditions are favorable and symptoms indefinite, and keep us on our guard against mistaking it for some less serious disorder. These divisions are, first, that in which the disease is pronounced from the beginning, and where attention is attracted immediately to the chest by prominent symptoms; and, second, that in which the onset has not been noticed and the progress of the disease has been marked only by a general deterioration, on a superficial examination no symptoms of any respiratory trouble presenting themselves. The difference between the two clinical forms is an artificial one and not real; it depends partly on the etiological variety of the disease, and partly, as was said, on lack of observation or of expression of symptoms, thus, in those cases which are least urgent, leading to a minimizing of the gravity of the condition.

For diagnostic purposes this division is of a certain amount of importance, for when the onset has been insidious, pneumonia could with certainty be excluded, and we should have to deal only with a question of the nature of the fluid. Considering empyema of both types, we have first to differentiate between pneumonia and pleural effusion, and then, when the fact of the existence of an effusion is established, the determination of its nature.

In the first form, which may be called acute, in contradistinction with the second or latent, the attack will very likely have been ushered in by the symptoms of pneumonia, for it is the metapneumonic empyema that is most frequently sharply marked and acute. It is for this very reason that a mistake is likely to be made here in diagnosis. Pneumonia has been clearly recognized, and when the child's condition

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fails to improve satisfactorily after a proper lapse of time, the tendency is towards regarding the case as one of retarded resolution in pneumonia rather than of empyema. The close similarity between the physical signs makes this mistake the easier. A point of distinct value in diagnosis here is this, when empyema has supervened upon a pneumonia it will generally be found to have commenced after the case has advanced some steps towards recovery, and there will have been then a period of amelioration of symptoms with a subsequent increase in gravity. If, on the other hand, there has happened not an empyema, but simply delayed resolution, or even abscess of the lung, there will have been no such temporary improvement. If the empyema has supervened during the acuteness of an attack of pneumonia the general symptoms will be of little use and sole reliance will have to be placed upon physical signs. Even when an effusion has come on during the course of, or subsequent to, a pneumonia it is not necessarily purulent, and the diagnosis has still to be made between empyema and sero-fibrinous pleurisy. When there has been no antecedent pneumonia, and this acute form of empyema has been primary, a variety which is likely to be not metapneumonic, but that due to pus organisms, the symptoms are so like those of pneumonia, as to make a diagnosis based wholly upon them difficult or altogether impossible.

These symptoms—and this applies equally to pleurisy and empyema for whether the effusion be serous or purulent the symptoms in the beginning of an acute case are practically identical and indistinguishable from each other—are sharp pain, fever, distressing constant cough, dyspnea, manifested by rapidity of respiration and by play of the alæ nasi, and such general disturbance as would be due to the increase of temperature. The fever in such a case is almost uniformly high, with no more fluctuations than would be the case in pneumonia. It is only much later that distinct remissions may occur, and even then they are the exception rather than the rule. When they do occur they would point strongly towards empyema rather than pneumonia or serous effusion. Profuse sweating is only uncommonly present and is of little importance. As between pleural effusion and pneumonia,—for, as has just been said, whether the effusion be serous or purulent the symptoms in a marked and acute case are the same,—the only symptoms which have seemed to me to have any diagnostic importance are dyspnea and pain. In empyema the dyspnea has often seemed to be more sharply accentuated than in pneumonia, the respirations are no more rapid, but there is a more noticeable play of the alæ nasi, a more evident sense of discomfort. Pain, too, is greater, and this pain is to be gauged not by the expression of the child, but by a hyperesthetic condition of the affected side of the chest. It is probable that this hyperesthesia is

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accountable for the more pronounced dyspnea. But these symptoms are merely suggestive and not of any convincing importance, they serve only to accentuate the results of physical examination.

When the empyema is latent, a condition which finds its best type in the tuberculous variety, though it may exist in either of the other two, symptoms pointing towards disease of the respiratory apparatus may be few and indistinct, even when they are carefully and intelligently sought for. The superabundant vitality of a child, with the enormous activity of its reparative processes, leads it to bear, with surprising equanimity, the most deadly inroads of disease, if these be but made slowly, and this form of empyema exemplifies this most fully. I have seen a child playing about and to all appearances not seriously ill, with a pleural cavity full to the apex with pus. While the heart is not too much embarrassed there will be but little dyspnea, and strangely the pus seems to have little effect upon the system. There is always some dyspnea, but this is shown only by the nose. Fever may be entirely absent, or present in such slight degree as to attract no attention. In the earliest childhood, if there be fever, it is likely to be of a continuous type. It is in older children that distinct remissions show themselves and hectic begins to become evident. When such remittent temperatures are encountered, they are, of course, of extreme importance diagnostically. From the nature of the symptoms and the course of the disease there can be no pneumonia, and where it is a question solely of the nature of a pleural effusion, a hectic temperature will point almost unfailingly to empyema. Sweating is a symptom which is frequently present, and, though it is not usually profuse, yet it is probably the most important of all as indicating very strongly an empyema.

Seeing, then, that in the latent form the symptoms are so poorly marked, and in the acute form so closely similar to those of pneumonia, it is evident that our only valuable diagnostic guide is that furnished by physical signs, but even here we are often at fault, since the chest-walls in a child are so thin and elastic that the physical signs of an effusion may exactly simulate those of consolidation.

The physical signs upon which we rely for a diagnosis between empyema, or any other pleural effusion, and pneumonia in a child are, of course, the same as those we have at our command in an adult, but while in an adult this diagnosis is easy and sure, in childhood it is generally difficult and occasionally impossible. The physical signs of effusion may be so clearly marked as to indicate at once the nature of the case. Most notably is this true where we can demonstrate movable dulness or displacement of neighboring organs, though there are many cases where, while these signs cannot be elicited, the others are still distinctive. When, on the other hand, they are not clearly marked

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and simulate almost perfectly those of pneumonia, the one on which most reliance can be placed for a diagnosis is the breath-sound. In effusion the tubular breathing differs slightly, it is true, but significantly from that of pneumonia in being sharper, more metallic, more superficial, but not so loud, there being an accentuation of character at the expense of volume. Râles are next in importance. When they are present they are more metallic and distant, they give the impression of being conducted from a distance. The voice-sound, too, is of some importance, it is a trifle more metallic and higher pitched than in pneumonia. Tactile fremitus cannot be relied upon at all in a young child as a diagnostic sign. It is difficult to elicit it satisfactorily enough for accuracy, and when it can be elicited it is very likely to be as prominent in empyema as in consolidation.

As between serous and purulent effusion the diagnosis is even more difficult, and I have been accustomed to rely here upon the history of the case and the general appearance of the chest rather than upon physical signs. In acute cases the history will furnish no definite diagnostic hints, but where the fluid has remained unabsorbed for some time, and, more important, where there has been marked deterioration of general health, a diagnosis of empyema is to be made, and this is strengthened, if in addition there is present an irregular fever with sweating. Of more moment still than the history is the appearance of the chest. In empyema the affected side looks rather fuller, the superficial veins are more prominent, and, most distinctive of all, there is often a peculiar glossy appearance of the skin, which indicates pus. This is not an edematous condition of the chest-wall, but resembles edema closely in appearance, though the tissues do not pit on pressure.

Physical signs, as was said, are unreliable in the diagnosis of the nature of the effusion. The ʃ-shaped line of the upper limit of the effusion, and the freedom with which the area of dulness changes its position with the change of position of the child are dependent on the amount and tension of the fluid, and not on its character. Bacelli's sign, whispering pectoriloquy, is not reliable. Whether it be absent or present probably depends altogether on the tension of the fluid. In two of the cases cited below this whispering pectoriloquy was present, even though the effusion was thick pus. In adults I have had the same experience; here, too, it is not to be relied upon.

As the diagnostic symptoms and signs may be so indefinite it becomes necessary to make in many cases an exploratory puncture. This in a child can be easily and harmlessly done. Even though the needle may be plunged into lung-tissue, no danger is to be apprehended. This exploratory puncture is often our only means of making a definite diagnosis between pneumonia and effusion, and oftener still the only way

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we have of determining the kind of fluid present. It may be made with an ordinary hypodermic syringe, but better with an aspirator, so that if fluid be found its immediate evacuation may follow. As has been said, an empyema is sometimes formed on a basis of a simple serous effusion, so when the progress of the case is not satisfactory a series of punctures must be made extending over a series of days, and sometimes such persistence will be rewarded by the eventual discovery of pus. This empyema must not be attributed to the exploratory punctures, for if made with proper precautions they are absolutely harmless and incapable of producing pus.

The diagnosis of the variety of empyema can be made with certainty only by a microscopic examination of the pus, but there are some clinical facts often prominent enough to warrant a tentative diagnosis in the absence of opportunity to make such examination. Pneumococcus empyema usually follows or accompanies a pneumonia, is acute in its character, with prominent but not very serious symptoms. It has a tendency to perforate the lung and evacuate itself through a bronchus. The pus is creamy and thick. Tuberculous empyema is essentially latent, slow in its accumulation, may be irregularly localized, and may eventually perforate the parietes. Its pus is thin and often flocculent. Empyema due to pus organisms is frequently latent, or when acute has prominent and grave symptoms. It is not likely to perforate. It frequently follows the specific fevers or some demonstrable pyogenic lesion. The temperature may be remittent. The pus is thinner than in the first variety, but thicker than in the second.

The following cases are introduced because they have recently been under observation, and because they illustrate quite well the course and termination of metapneumonic, the commonest form of empyema:

CASE I.—Girl, aged 7 months. Five weeks before coming under my observation, the child, well nourished at the time and in remarkably good health, had been taken suddenly with a markedly febrile attack attended with severe general symptoms, constant harassing cough, and very rapid breathing. The diagnosis made at this time by the attending physician was pneumonia, and, from what I was able to gather from the history of the case, as detailed by the parents, I have no doubt was the correct one. The subsequent history is necessarily indefinite, but with all its indefiniteness still remarkably characteristic of pneumonia. At the end of a week the symptoms ameliorated, the temperature declined, but there was at no time a perfect restoration to health. Soon what little improvement had been gained was lost, emaciation progressed, appetite failed, and, finally, in the eyes of her parents, the child was more seriously ill than in the initial attack. When I first saw her she was extremely emaciated, appetite poor,

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stomach not always retentive, and bowels often irregular. Respirations were shallow and rapid, ranging from 60 to 70 in the minute with free play of the alæ nasi. The heart's action was quick, weak, and labored, the apex beat in the fifth interspace, just outside the nipple line. The general surface was a little cyanotic, and the finger-tips beginning to be clubbed. The temperature was irregular, occasionally normal, but oftener above, sometimes reaching 103° F. There was absolutely nothing regular about the temperature curve, the exacerbations occurring quite as frequently in the morning as at any other time, and on alternate days there might be almost apyrexia and sharp fever. The right chest was distinctly fuller than the left and showed less movement. The interspaces were thought to be somewhat prominent. The cutaneous veins were certainly fuller than those upon the opposite side, and there was a general glossy appearance of the skin, though there was no edema. From apex to base this side was perfectly dull, with a distinct sense of doughy resistance, tactile fremitus was poor, and breathing tubular. As well as can be gotten in a child of this age the voice sound, as determined by the cry, was that of a nasal pectoriloquy, and when the cry was almost suppressed and partly sobbing, what might answer to whispering pectoriloquy could be plainly heard. At no point could any signs be located which might serve to indicate beneath, the existence of a compressed lung. It was impossible at first to gain the consent of the parents to aspiration, but this was at last obtained, and, with the assistance of Dr. W. S. Carter, I drew off seven ounces of thick, creamy-yellow pus, blood stained at the last from laceration of adhesions by the end of the canula. The child's condition immediately before aspiration was interesting; we were assured positively by the mother that almost twenty-four hours previously the child had become suddenly and distinctly easier, and that this improvement had been coincident with the establishment of a loose cough with free expectoration. The inference, of course, was that the empyema had ruptured into a bronchus and was discharging. Careful physical examination, however, failed to show any change in the physical signs, and the results of the aspiration most definitely negatived any communication with a bronchus. It is interesting, too, to note how the lung—compressed absolutely as it must have been for at least a month—behaved after aspiration. Immediately after all the pus had been withdrawn the lung filled fully the pleural cavity, everywhere a good respiratory murmur could be heard replacing the previously existing tubular breathing, and over the whole side was a clear tympanitic percussion note. For a few days after the aspiration, fluid, presumably pus, slowly reaccumulated, then it was slowly absorbed, and a month afterwards the lung was apparently perfectly normal. From the time

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of the aspiration the temperature was normal and the bodily condition of the child steadily improved.

CASE II.—Girl, aged 4 years. Seen in consultation with Dr. F. H. Milliken. Two weeks previously she had had a mild attack of pneumonia involving the lower lobe of the right lung. The symptoms were not at all grave and the physical signs rather those of broncho-pneumonia. There were spots of imperfect consolidation scattered through lung-tissue apparently unaffected. The temperature fell by crisis at the end of a week, and for a few days she was apparently rapidly returning to perfect health, when the original symptoms returned. When I saw her, her fever was moderately high and continuous. There was irregular but not marked sweating; face a little dusky; cough constant; dyspnea marked. Complained greatly of pain in the left side, which was tender to the touch. Left chest was dull from apex to base; breath-sounds tubular; whispering pectoriloquy. Twenty ounces of thick, creamy pus were withdrawn immediately, with prompt relief to the symptoms. Within three days the pleural effusion had partially reaccumulated, there was still some fever, but the symptoms were nowise as urgent as before the aspiration. At this time she passed out of Dr. Milliken's care and the subsequent history is indefinite. She is said to have been ailing for some weeks, and at one time to have expectorated large quantities of purulent matter. However, she eventually made a good recovery without any further operative interference.

CASE III.—Boy, aged 6 years. Two weeks before coming under observation had what was said to be grippe, but what was really, in all probability from the symptoms, a mild pneumonia. He did not recover from this, and when I saw him was emaciated, had a distinctly hectic temperature, coughed incessantly, with little expectoration, and complained bitterly of pain in the right side. Physical examination showed over the lower half of the right chest immovable dulness and absence of breath- and voice-sounds. Tactile fremitus over the dull area was exaggerated as compared with the corresponding area on the left side. Exploratory puncture showed pus. The parents refused to permit aspiration. A week later he began to expectorate freely large quantities of pus containing pneumococci. Coincidently with this there was a distinct improvement in his symptoms, and a week later a marked decrease in the area of dulness could be demonstrated. His improvement progressed uninterruptedly, and in six weeks from the first purulent expectoration he was apparently perfectly well. At this time there could be detected nothing wrong in the right lung.

CASE IV.—Boy, aged 2 years. Had a severe attack of pneumonia with complete consolidation of the upper lobe of the right lung. Was discharged at the end of ten days apparently perfectly convalescent.

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Two weeks later, when I was again called to see him, there was dulness throughout the whole of the right chest, tubular breathing, distant metallic râles, exaggerated tactile fremitus. The right chest was enlarged, the veins dilated, the skin glossy and a little dusky. Exploratory puncture showed pus. The general symptoms were not pronounced. The child was evidently not well, was peevish and fretful, but walked about and made occasional attempts to play. There was neither fever nor sweating. The parents refused aspiration, and the child was placed upon supporting treatment, with occasionally a sedative to relieve the cough, which was not very troublesome. For some months there was no change in the general condition nor in the physical signs. Then a gradual improvement began, and the fluid in the chest lessened. Nine months after the beginning of the empyema the fluid had apparently been all absorbed, but the pleura was much thickened generally, and the breath-sounds so harsh as to suggest quite an extensive fibroid change in the lung. During the next four months the lung gradually cleared up, till at the end of that time the respiratory murmur was perfectly normal, and there was no evidence of any thickening of the pleura.

In these cases will be noticed two methods of the termination of empyema. The first is by penetration of the lung and evacuation through a bronchus, and is shown in Case III and possibly in Case II. This method is unquestionably more common in childhood than in adult life; but why this should be so cannot be determined, nor is the exact process by which it is accomplished at all understood. That discharge through a bronchus is in some manner connected with the nature of the effusion is evidenced by the fact that this event is much the most common in metapneumonic empyema. In fact, from the frequency with which it occurs in this form, this would seem to be here the normal termination of empyema. The amount of effusion seems to have little to do with it, small localized empyemas not infrequently terminating thus. It can easily be supposed that the pneumonic lung, which has given rise to the empyema, will by virtue of its condition yield more readily to the entrance of pus. Or the reason may still lie in the condition of the lung and yet be a purely mechanical one, the consolidated portion being incompressible may offer an easy outlet. This attempt on the part of nature to heal not always results in a perfect success, and is too often abortive. When in addition to pneumococci, pus organisms are present in any considerable number, extensive destructive lesions of the lung may be set up by their introduction into its tissue, vitiating the good done by the liberation of the pus. If the organisms be not inimical to the health of the lung, a small fistulous tract may be formed, through which the pus is forced principally by

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coughing, and the lung, readily expansible as it is in childhood, easily follows the lowering fluid till it finally is closely reapplied to the parietes throughout the whole pleural cavity, and a cure results. During this process air is rarely admitted, the pressure of the effusion more than counterbalancing that of the inspired air. The other method of termination referred to is absorption of the pus. This must in itself be an event of great rarity, but that it may occur is proven by the case cited. While this termination is of little importance as a curative measure, yet secondarily in connection with other processes it becomes of great service. From the nature of the pleural cavity it is practically impossible that it should be thoroughly drained except after the lapse of such time when the assistance of the expanding lung is brought into play. But if we grant that the contents of an empyema may be spontaneously absorbed, it will at once be seen why a single aspiration may be successful, or an empyema may heal a very short time after the perforation of a bronchus. The pus is here by no means all drained off. Merely enough is abstracted to permit of the rapid absorption of the remainder. So we get a more hopeful prognosis, but at the same time we must not permit ourselves to rely too much upon this assistance of nature. The third method of cure, and one which must be spoken of, as on it is based all operative procedures, is by perforation and evacuation by channels other than the lungs. The most common point of perforation, and fortunately the one most likely to lead to cure, is the chest-wall. Many other points of perforation have been recorded, but none of them are favorable, and little likely to lead to fortunate results. In childhood, when perforation of the chest-wall takes place, this usually occurs high up, often in the second interspace, and yet the discharge of pus takes place at this point as freely as though it were at a point more favorably situated for free drainage, showing that the pus is really forced out by the expanding lung and not drained away. That this perforation is not more frequently followed by perfect cure is due to the condition of the lung and to the variety of empyema in which it occurs. If the lung, in addition to being collapsed, is partially consolidated or has undergone any degree of fibroid change, its expansive power will be so slight as to be of little use in forcing out the effusion. Tubercular empyema is the form which is most frequently followed by perforation, and here from the nature of the process the outcome can be nothing but disastrous. In empyema due to pus organisms perforation is uncommon. When it does take place it is through the chest-wall, with the possibility, though not probability, of ultimate perfect cure. In this form the lung would seem to be seriously crippled, probably by a dissemination throughout its structures of the pus organisms, and consequently less able to

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expand, and so aid in the drainage of the pleural cavity If the case be left wholly to nature, long-continued suppuration is likely to result, with its necessarily bad termination.

For some time after the existence of an empyema the lung is simply compressed, there is no organic change in its structure. The pyogenic membranes covering its surface do not seem to organize and contract as early as in an adult, so that expansion easily follows removal of the pus. But eventually a fibroid change takes place in the pulmonary tissue, seriously impairing its elasticity. This is most marked and earliest brought about where pus organisms are present, and seems to be the result of the presence of these organisms, rather than of the mechanical collapse of the lung. The process is inaugurated by a widely-scattered catarrhal condition of the vesicles and finer bronchi. Eventually this involves the fibrous tissue, and a thickening and contraction result.

Treatment.—Prompt evacuation of the pus as soon as its presence is recognized is the only measure that can be taken which promises any good result. In metapneumonic empyema a single aspiration may, and undoubtedly often does, effect a cure. The chest must be emptied as thoroughly as possible, the only precaution being taken to proceed slowly with the evacuation in order to give the lung plenty of time to expand, and to run as little risk as possible of the oozing of blood from the congested pleura. There will always, even in favorable cases, be some reaccumulation of pus, but this ought to subside shortly by absorption. If it does not subside, or if there is any excessive reaccumulation, a second evacuation is necessary, and this is to be repeated, till it is positively demonstrated that a cure will not thus result before more radical measures are adopted. While it may be necessary to eventually introduce a drainage-tube, yet temporizing by means of aspiration does no harm. I cannot deprecate too strongly from my own stand-point the placing of all empyemas in children in the hands of a surgeon, for I am certain that in a notable number of cases simple aspiration is perfectly competent to effect a cure. Where the case has existed for a long time, or where pus organisms are the exciting cause, or where repeated aspirations have failed, the introduction of a drainage-tube is necessary. There is only one class of cases where resection of ribs is to be advised,—that is tuberculous empyemas. In all the others it is not necessary to go further than aspiration or a drainage-tube.

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ANTERIOR POLIOMYELITIS.[1]

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(CONCLUDED FROM PAGE 72.)

The inequality of muscular power following an attack of anterior poliomyelitis renders the limbs (especially those of the lower extremities) subject to deviation, alteration, and deformity, not only of the muscular and fascial systems, but also of the osseous structures. These deviations are not due to the fact that a particular set of muscles acts too vigorously, but simply that the inactivity of another particular set permits the stronger muscles to draw the limb in their direction; weight-bearing soon adds to the deformity, permitting shortening of the fibres and inclination of the member in the direction of the greatest power, which is usually at the hip and knee that of flexion. At the ankle the alteration in form will be either inward or outward, according as the peroneals or tibials have been weakened. As has been stated, locomotion in the deformed position soon alters the shape of the bones and produces serious distortion, from stretching of ligaments and partial dislocations may even ultimately result, especially when the child rolls about the floor and exerts itself with the natural eagerness of childhood.

A large majority of these deformities can be prevented by care and attention on the part of the surgeon. Immediately after the primary attack frequent manipulations and stretching should be employed to retain the natural length of the stronger muscles, while the weaker ones should receive persistent and long-continued massage and electricity. This method of prevention of deformity should be continued for years. The process is a discouraging one, and little or no results will be visible for a long time, although great gain will actually have been accomplished by perseverance, not only in preventing atrophy but also in obtaining real increase of power.

As soon as the child has acquired sufficient power to walk, the tendency to deformity will greatly increase any existing deviation from the normal line; weight-bearing should, therefore, be immediately assisted by a properly applied apparatus, which, if scientifically constructed,

[1] One of the Mütter Course of Lectures, delivered before the College of Physicians of Philadelphia, 1893.

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will not interfere with nutrition or development, but, on the contrary, will greatly aid these conditions by encouraging muscular action. The muscles should be stimulated to do the utmost they are capable of performing, and stop-joints, lock-joints, and elastic assistance to the muscles should be judiciously, but only temporarily, applied, and should be removed just as speedily as the muscles acquire power for themselves.

No positive rules can be laid down for the construction of apparatus; this is a matter which requires much thought and ingenuity, and the adaptation of an appliance should be done only by a skilful surgeon. In no instance should an instrument-maker be allowed to apply an apparatus; he will simply adapt the case to his particular form of brace, instead of constructing the apparatus according to the needs of the individual. Massage, electricity, stretching, and manipulation should practically never cease until the individual has fully acquired his growth, and some of these cases demand attention throughout their lives, requiring frequently skilled operative and mechanical assistance.

The conditions which demand surgical relief are the late deformities, usually in the direction of flexion. These deformities often incline to a severe degree of distortion of the bones, stretching of the ligaments, contraction of the fasciæ, muscles, etc., particularly at the hip, knee, and ankle. An extreme degree of lateral curvature of the spine is also present in certain serious cases. In flail-limbs, where there is complete loss of power, and where the child has been constantly on the floor in peculiar positions, there is frequently distortion of the head and neck of the femur with relaxation of the capsule and round ligament. Even when flexion is overcome, this deformity seriously interferes with locomotion. Bone distortion at the hip, however, can be seldom overcome by surgical procedures, except by removal of the limb. Amputation, however, is rarely to be considered, as the majority of individuals prefer to retain even a helpless member rather than to sacrifice it, even though its removal would relieve them of an incubus.

Even when there is great deformity at the knee and ankle amputation is not advisable except when the distortion is extreme; but with a good limb upon the opposite side an artificial foot can be adapted and made to render good service. As a rule, however, the foot and leg can be brought into such line that with proper apparatus it can be made a useful member for weight-bearing service.

At the knee, when the deformity is great and accompanied by partial dislocation, an excision of the knee and fixation of the extremity, so as to give a stiff walking member, is frequently advisable. Many cases, however, will refuse to submit to this procedure, as it necessarily involves a slight risk of life.

The principal surgical procedures will be *myotomy*, *tenotomy*, *fasci-*

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otomy, etc., and these frequently require to be multiple and extensive. At the hip, division is made of the tensor vaginæ femoris, the fascia lata, the long head of the rectus, the anterior fibres of the gluteus, and sometimes the sartorius; occasionally the psoas and iliacus need division. While it is perfectly possible to divide the former muscles subcutaneously, the latter cannot be attacked without open section, and when the fascial contractions approach the anterior crural nerve or the vessels, open division is always judicious. In minor cases, however, the subcutaneous method is advisable, as an open incision always leaves a large gaping wound which heals slowly.

At the knee, if the contractions lie solely in the semimembranosus semitendinosus, and biceps, subcutaneous section is preferable. When the fasciæ, especially in the mid-popliteal space, is contracted, open incision is demanded. The peroneal nerve should, of course, be carefully avoided.

The bony distortions at the knee are exceedingly difficult to overcome. When tenotomy fails, excision is demanded with subsequent fixation of the bone. At the ankle serious distortions occur, but they are usually remediable without bone removal. Extensive fasciotomies and tenotomies are, however, demanded, all the contracted tissues being divided. The same rules will be observed as are followed in the rectification of club-foot,—that is, the application, after section, of powerful stretching, so as to bring the foot as nearly as possible into its normal position, thus accomplishing complete ratification while the patient is under ether and avoiding subsequent pain and difficulty.

Tissues which have been long contracted cannot be extended by mechanical processes without much loss of time and the infliction of pain. To attempt to relieve these difficulties by apparatus is unjustifiable when surgical procedures are safe, sure, and effective. Of course, mechanical appliances, which have already been alluded to, must be applied after operation in order to prevent relapse of the deformity.

In slight cases these appliances may be very simple, but in feeble cases, flail-limbs, etc., apparatus demands much thought, as it is an essential help to walking powers. The legs are used for the attachment of what are practically artificial limbs. By the judicious combination of stop-joints, elastic straps, springs, etc., together with the use of axillary crutches, perineal crutches, or wheeled crutches, locomotion becomes possible, and under its stimulation many cases which otherwise would be condemned to a helpless life upon the floor can be benefited, so that they will be able to walk for miles as the muscular power is slowly regained. Action is the best stimulation for the muscles; massage and electricity are helpful, but locomotion is the best aid.

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A CASE OF MULTIPLE SARCOMA OF THE ABDOMEN, FOLLOWING TRAUMATISM, WITH AN INTERESTING MEDICO-LEGAL SEQUEL.

By James M. Brown, M.D.,

Assistant Aural Surgeon, University Hospital; Aural and Ophthalmic Surgeon, Western Temporary Home.

During my daily visits to Thomas M., on January 3, 1890, my attention was called to his son, a boy aged 8 years, of short stature, but otherwise well developed, of lymphatic temperament, who I was told had been assaulted some two or three hours previous by a neighbor, who struck him about the head, kicked him in the left side, and otherwise in a general way roughly maltreated him.

At the time of my visit he was lying in bed, pale, nervous, weak, with a staring, frightened expression, easily startled, showing every evidence of nervous shock. Examination showed but little positive evidence of injury other than some slight abrasions of the skin about the side of the face and neck, some tenderness on pressure in the left hypochondriac region, which later seemed confined more particularly to the abdominal wall. He complained of constant pain in the head; pain and soreness on movement in the left hypochondriac and lumbar regions. There had been no loss of consciousness nor any evidence of any cerebral lesions; general functions well performed, though at the time of the alleged assault there had been involuntary discharge of the contents of both bowel and bladder, loss of control over these organs being more the result of fright than of injury.

By reason of an attack of la grippe in my own person, I did not again see the patient for four days, when he had so far recovered as to be able to sit up and move a little about the room. His mother at this time said that his sleep was fitful, easily broken, attended by moaning, and that he frequently awoke crying out in fright, appealing for help from supposed harm.

He still complained of pain in the head, but more of pain in the left hypochondriac and lumbar regions. These symptoms gradually ameliorated until about February 21, when my visits to the family became less frequent, and the case passed from my notice until April 1, when I was called to see him suffering with acute suppurative inflammation of both middle ears. He had lost flesh, was weak, nervous, and anemic, and though still present there was subsidence in the severity of the former subjective symptoms.

The inflammation of the middle-ear cavities quickly responded to appropriate treatment, and having placed the patient on tonic remedies,

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he again passed from my immediate notice, being able to visit my office to receive the last several ear treatments. The mother's imagination, awakened by a keen sense of the wrong done, or the injury inflicted to her child, together with his still occasional frightful starting from sleep, now led her to think he had heart-disease, to which, after careful examination, I could not assent, and tried to explain to her the resulting existence of a purely functional derangement of that organ. This apparently did not satisfy her, and as she left my office I could see there was little hope of her instituting the treatment I had outlined. In the course of some ten days or two weeks after, abdominal swelling having manifested itself, he was taken to a physician in a distant portion of the city, who rendered a diagnosis of ascites, and referred him to a physician nearer home for treatment, who, on learning of my connection with the case, returned him to me, with the suggestion that he had abdominal dropsy and would need tapping at once. On examination at this time I found the abdomen evenly distended to its utmost apparent capacity. Tympanitic resonance marked only in the umbilical and right lumbar region; dulness with distinct wave-like fluctuation in both inguinal and hypogastric regions, while in the left lumbar and left hypochondriac regions there was decided flatness on percussion, with presence of a large solid tumor-like mass, which could be distinctly felt through the abdominal wall, and which I believed to be in relation with the spleen. The superficial veins of the abdomen were enlarged and distended, the patient was greatly emaciated and in great distress, owing to the abdominal and thoracic pressure. The respiration very shallow, and averaged about 35 to the minute; pulse 140.

Impressed with the fact that we had a more serious condition than abdominal dropsy to deal with, I very reluctantly consented to tapping, which was done in the presence of the physician last spoken of, selecting the median line about the upper border of the hypogastric region, using a simple canulated trocar, removing about twenty-four ounces of sero-sanguinolent fluid and pus, to the great relief of our patient. The distressful breathing giving way to comparative comfort soon followed by refreshing sleep. Flow from the opening left by the trocar continued about twenty hours, discharging in that time probably twenty ounces more of the same sero-sanguinolent fluid. At the end of this time tympanitic distention of the abdomen recurred, attended by a renewal of all the distressful symptoms relating to breathing, etc.

Dr. John B. Deaver was then asked in consultation, together with whom and his brother, Dr. H. C. Deaver, laparotomy, splenotomy, or splenectomy were discussed. Physical examination now showed pulse 160; respiration 40; temperature 104° F.; abdomen generally distended, favoring in fulness the left side; no fluctuation, but marked tympanitic

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resonance everywhere, excepting within an area marked by a line commencing anteriorly between the tenth and eleventh ribs at junction of posterior axillary line, extending upward and backward for five inches to the spine of the eleventh dorsal vertebra, bounded in front and below by a line from same starting-point, obliquely downward and backward to midway between the last rib and crest of ilium, thence more directly backward to about the fourth lumbar vertebra; elsewhere resonant excepting a circular area two inches in diameter in front of the anterior axillary line at the upper left border of the umbilical region, thus making the two areas of flatness with well-marked intervening percussion resonance, which is held by some as diagnostic of spleen

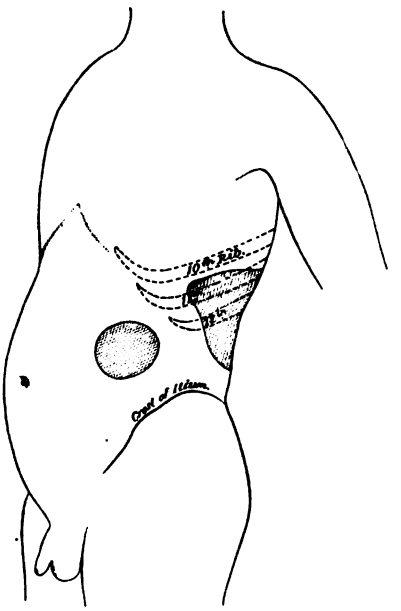

FIG. I.

abscess. (See accompanying diagrams.) After due consideration it was decided to first use the aspirating needle in exploring the left lumbar region, which resulted in finding about an ounce and a half of this same sanguinolent fluid and pus. An incision was then made through the skin and lumbar fascia down to and laying bare the spleen, which organ was seen to make regular excursions upward and downward, corresponding to the movements of the diaphragm in respiration. Exploration disclosed a nodular mass, involving and uniting the several tissues and organs of the locality, so that further operative procedure was not to be thought of. A drainage-tube was

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inserted and the wound closed by interrupted sutures. With the patient under ether the operation lasted but a few moments, and was done rigidly aseptic. Death, already imminent, took place about two hours after, no doubt hastened by surgical shock and by ether.

On post-mortem examination, twenty-two hours after death, the abdomen was greatly distended by gas, and the presence of the drainage-tube was noted externally, in the left lumbar region, on the outer side of the erector spinæ muscle. On cutting through the tissues of the chest and abdomen, there was free flow of malignant odematous fluid. The great omentum was much thickened from malignant odema

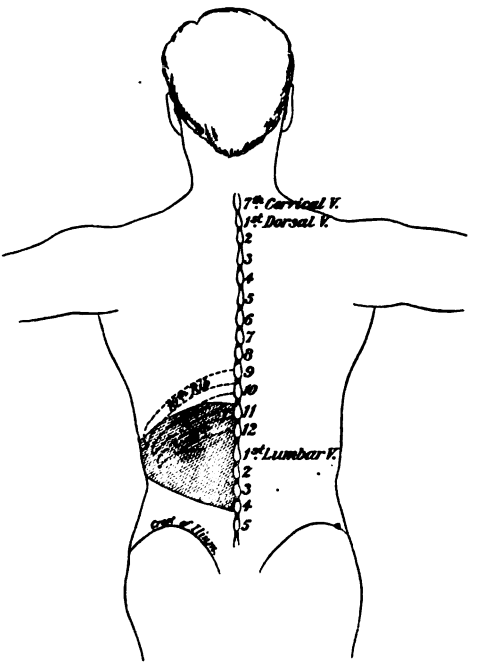

FIG. 2.

and purulent infiltration, and shows many small nodules from a pinhead to a pea in size, some soft and friable, others more firm and protected by the layers of the peritoneum, and are apparently due to infiltration from the new growth which was found later in connection with deeper structures. Surrounding the spleen was a large amount of lymph, partly purulent, partly organized into firm nodular masses about the size of a marble, with connecting bands and trabecula, firmly adherent to the stomach, liver, and other surrounding parts; the mass just alluded to is a neoplasm, evidently of sarcomatous character, and involved also the peritoneum, pancreas, stomach, liver, and dia-

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phragm, and possibly all the lymph-glands. On section, it proved to contain an abscess cavity, which at the point of adhesion to the stomach communicated with it through a large perforating ulcer posteriorly, and by a smaller opening through its anterior wall with the peritoneal cavity; the necrotic change, having taken place in the neoplasm primarily and subsequently by a process of ulceration, involved the cavities just mentioned; that portion of the new mass containing the abscess was in intimate union with the spleen; dissection showed, however, that this organ was not involved primarily, its capsule was thickened, and even where not attached to the mass, was irregularly covered with deposits of lymph; the organ was slightly hypertrophied and of softer consistence than normal, its pulp pale red or pink. The nodes of the tumor mass surrounded the spleen and were attached to its capsule, and extended along the common duct to the cystic and hepatic ducts, over the surface of the gall-bladder, hepatic vessels, and ducts, and infiltrated the tissues of adjacent portions of the liver about one inch or more in depth. The liver is not otherwise involved, except that there is cloudy swelling; kidneys not involved, and normal with the exception of cloudy swelling; whole peritoneum is studded with deposits from the tumor growth, it is much thickened, and its cavity contains several ounces of grumous bloody fluid; it is not perforated by the incision at point of operation, and the drainage-tube does not enter the peritoneal cavity. Lymph-glands are but slightly involved, and generally exhibit cloudy swelling. Alimentary canal throughout presents nothing abnormal. The diaphragm is infiltrated and fully four times its usual thickness; the new growth extending through and beyond it into the mediastinum and anterior chest-wall, especially involving that part of the pleura covering the under surface of the lungs, or lining the anterior mediastinum and anterior chest-wall, with nodular masses and organized lymph patches uniting the pleural surfaces. Both pleural cavities and the pericardium contained a large amount of turbid fluid. Pulmonary tissue odematous, boggy, and congested. Heart slightly dilated, stopped in diastole, both sides filled with dark clots; muscular tissue, orifices, and valves normal. Pericardium thickened with patches of recently-deposited lymph here and there over its surface.

The death of Dr. Formad, who conducted the autopsy, resulted in losing all trace of the specimens, and thus prevented a further study microscopically.

Interesting as proved the study of the various conditions of this case in life, or of the lesions revealed post-mortem, it continued to attract unusual attention by what seemed very contradictory phases in its medico-legal aspect.

The alleged perpetrator of the abuse having been arrested immediately on its infliction, and placed under bond for appearance at court,

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charged with aggravated assault and battery, was now, on the death of the child, rearrested on the more serious charge of murder, and after languishing in prison about a month, brought to trial,—where a strong chain of evidence was adduced establishing the commission of an assault and injury, and its relation to the death of the child.

The unexpected change of attitude, on cross-examination, by the defence, of one whose testimony wholly related to the post-mortem discoveries, the nature, cause, and origin of sarcomatous growths, led the district attorney to ask an abandonment of the case; the learned judge concurring, holding that, while the testimony just adduced in relation to such growths, show that they are considered to be of unmistakable inflammatory origin, associated with a history of traumatism, yet the impossibility to always trace them to such origin, or preclude their possible prenatal existence, would give room for such a reasonable doubt as to their cause in this case, as to justify an abandonment of the prosecution. Or again, though it might be shown that in a *pre-existing growth* or structure, in *itself necessarily fatal*, at a more or less remore period, there had been set up as a *result* of the *injury inflicted*, a *new*, and *more* or *less separate* train of morbid changes, which *hastened* the fatal termination, it would not constitute murder, and the charge must fall.

The former charge of aggravated assault and battery, being in no way annulled by this decision, and remaining still in force, was at a subsequent term of court pressed to trial, resulting in a verdict of "not guilty." Such a verdict being due in a measure, perhaps, to lack of interest by the prosecuting officer after the disastrous result of the former trial.

The broken-hearted condition of the parents of the child, grieving not only at his untimely end, but also at their inability to secure redress for the great wrong perpetrated, awakened a friendly interest in one who had heard their sad story, and who, through sympathy referred them to his own attorney, asking his kindly offices in their behalf, who, after a careful investigation of the facts of the case, brought suit for damages. Viewed in the light of the results of the former trials the ground on which such an action could rest was, perhaps, too narrow and insufficient to be grasped by other than a legal mind. An aggressive suit was maintained, which, though sharply contested, resulted in a verdict for damages in the amount of 1000 dollars. Singular to relate, this sum was the amount by which the defendant was held in bond by reason of his absence in a distant State, his personal presence not being an absolute necessity at the time of trial.

The writer desires to acknowledge his indebtedness to Wendell P. Bowman, Esq., for a careful and critical review of the medico-legal portion of this article.

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LEUCOCYTOSIS.[1]

By William S. Carter, M.D.,

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(CONCLUDED FROM PAGE 93.)

Under the last heading (that of infections) we found that leucocytosis exists in all of the common infectious processes, except tuberculosis, typhoid fever, and measles. In the case of typhoid fever there may be an actual diminution in the total number of leucocytes, but there is a characteristic alteration in the proportion of the different forms,—the large mononuclear leucocytes, and especially the younger ones, being increased, while the multinuclear forms are decreased in number.

In scarlet fever there is also a difference in the fractional count,—the eosinophiles being more abundant than in normal blood.

The question naturally arises, What is the cause of the leucocytosis of infections?

The first thing to suggest itself is that we have some localized inflammatory process in these conditions. While this is true, it must be borne in mind that the extent of the inflammation bears no relation to the degree of leucocytosis, as has been stated in pneumonia and in peritonitis. Further, we find extensive localized cellular infiltrations in tuberculosis and typhoid fever, and less severe catarrhal inflammations of the mucous membranes in measles.

In all the infections there is more or less change in the lymphoid structures of the body, particularly the lymph-glands, which show a distinct hyperplasia. This condition is also present in measles, and is probably no more marked in any infections than in tuberculosis and typhoid fever.

Let us consider other conditions present in infections which might be causal of leucocytosis.

A very constant condition is that of pyrexia; there is commonly an altered degree of coagulability of the blood; there is often an alteration in the alkalinity of the blood; in all of the infections we have bacterial products entering the blood in variable quantities. These last may be grouped under the general term toxines.

Considering first the question of pyrexia, we do not find the degree of leucocytosis bearing any relation to the body temperature in any of the infections. Fever may be present in tuberculosis and measles, with-

[1] Paper read before the Society for Clinical Research, Philadelphia, May 22, 1894.

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out any alteration in the number or kinds of leucocytes, while typhoid fever with its marked tendency to pyrexia shows no leucocytosis, unless there be some complication of an inflammatory nature.

It has, however, been stated by Rorighi, and also by Ischlenoff, that fever experimentally produced in animals causes a diminution in the number of leucocytes.

In order to determine what effect pyrexia itself, independent of bacterial poisons, has upon leucocytes, the following experiments were undertaken:

EXPERIMENT I.—White rabbit of medium size.

2 P.M. . . . . R. B. C., 6,800,000
Rectal temperature = 40.2° C. . . . . W. B. C., 10,000
Placed in hot box, with dry air at temperature of 60° C.
3 P.M. Rectal temperature 42.0° C.
Placed in hot box again, at temperature of 65.5° C.
3.45 P.M. . . . . R. B. C., 6,900,000
Rectal temperature = 42.5° C. . . . . W. B. C., 14,000
Many free nuclei were found grouped together in masses.
Placed in hot box, temperature 54.5° C.
5.10 P.M. . . . . R. B. C., 8,000,000
Rectal temperature = 42.8° C. . . . . W. B. C., 17,000
5.45 P.M. . . . . R. B. C., 7,850,000
Rectal temperature = 42.3° C. . . . . W. B. C., 11,000
Next day . . . . . R. B. C., 6,800,000
Rectal temperature = 40.8° C. . . . . W. B. C., 12,400

EXPERIMENT II.—White rabbit.

1 P.M. Rectal temperature = 40.8° C. . . . R. B. C., 6,330,000
W. B. C., 4,000
2.15 P.M. Placed in hot box, temperature 49° C., gradually increased to 65.5° C. (dry air).
3 P.M. Rectal temperature = 42.2° C.
3.50 P.M. Rectal temperature = 43.2° C.
4.30 P.M. . . . . R. B. C., 4,420,000
W. B. C., 5,330
5.09 P.M. Rectal temperature = 43.1° C.
5.30 P.M. . . . . R. B. C., 5,040,000
W. B. C., 7,300
Many free nuclei in the field.
Next day . . . . . R. B. C., 4,250,000
W. B. C., 6,375

EXPERIMENT III.—Black rabbit.

1 P.M. . . . . R. B. C., 4,725,000
Hb = 55 per cent. (Gowers's apparatus) . . . W. B. C., 9,375
1.30 P.M. . . . . R. B. C., 4,775,000
Rectal temperature = 39.8° C. . . . . W. B. C., 5,250
Placed in hot box (moist air).

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2 P.M. . . . . R. B. C., 4,750,000
Rectal temperature = 41.8° C. . . . . W. B. C., 6,250
2.45 P.M. Rectal temperature = 39.2° C.
Placed in hot box again. Air saturated with moisture.
3.05 P.M. . . . . R. B. C., 4,225,000
Rectal temperature = 42.5° C. . . . . W. B. C., 6,250
Hb = 48 per cent.

EXPERIMENT IV.—Maltese rabbit.

2 P.M. . . . . R. B. C., 5,900,000
Hb = 58 per cent. . . . . W. B. C., 6,260
3 P.M. . . . . R. B. C., 5,550,000
Rectal temperature = 40.0° C. . . . . W. B. C., 9,300
Placed in hot box (moist air).
4.15 P.M. . . . . R. B. C., 4,637,000
Rectal temperature = 43.0° C. . . . . W. B. C., 6,250
Hb = 54 per cent.

EXPERIMENT V.—Dog; weight, 9.010 kilos.

2 P.M. . . . . R. B. C., 3,800,000
Rectal temperature = 39.5° C. . . . . W. B. C., 5,100
3 P.M. . . . . R. B. C., 4,700,000
W. B. C., 10,000
3.45 P.M. Placed in hot box (dry air) at temperature of 58° C.
4.20 P.M. Rectal temperature = 40.0° C. Respiration very rapid.
4.30 P.M. . . . . R. B. C., 4,460,000
Rectal temperature = 40.5° C. . . . . W. B. C., 9,300

EXPERIMENT VI.—Same dog as in Experiment V.

12 noon . . . . . R. B. C., 5,160,000
Rectal temperature = 39.5° C. . . . . W. B. C., 11,000
12.15 P.M. Placed in hot box (dry air). Temperature gradually raised from 48° to 65.5° C.
1.00 P.M. Rectal temperature = 39.7° C.
1.45 P.M. " " 40.2° C.
2.15 P.M. " " 40.5° C.
3.00 P.M. " " 41.0° C.
3.15 P.M. . . . . R. B. C., 5,570,000
W. B. C., 13,000
Placed in hot box again.
4.15 P.M. . . . . R. B. C., 6,000,000
Rectal temperature = 42.0° C. . . . . W. B. C., 15,800
5.15 P.M. . . . . R. B. C., 6,250,000
Rectal temperature = 41.0° C. . . . . W. B. C., 22,500

To determine whether or not there was any distinct alteration in the proportions of the different varieties of leucocytes, fractional counts were made of the leucocytes of the dog used in Experiments V and VI.

An examination of these results will show that the simple exist-

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ence of pyrexia does not cause leucocytosis. The acceleration of circulation is probably greater in thermic fever than in the specific infections, and the vaso-dilatation was very pronounced in all of the animals experimented upon.

	Experiment V. 2 P.M., Normal.	Experiment V. 5 P.M., after being in Box 1 Hour, Temperature raised 1° C.	Experiment VI. 4.15 P.M., after Production of Thermic Fever.
Lymphocytes	15.0 per cent.	7.0 per cent.	8.0 per cent.
Large mononuclear	5.0 "	6.0 "	4.0 "
Transitional	2.0 "	7.0 "	10.5 "
Multinuclear	78.0 "	80.0 "	78.0 "

A very curious condition of the blood was observed in these experiments. There were many free nuclei grouped together in masses throughout the field when the blood was examined in the febrile state. It was not observed after the fever had disappeared. This occurred too constantly to be due to coincidence or to faulty technique. The leucocytes which remained intact seemed quite equally distributed throughout the field.

These bodies stained fairly well, and gave the appearance of nuclei which had been liberated from leucocytes. They could not have been blood plaques, because they took the stain more readily than these bodies, and because they were observed while counting the blood-cells, —a procedure which would cause blood plaques to disappear. The blood plaques would certainly undergo rapid disintegration when the blood is drawn into the capillary tube of the hemacytometer pipette.

This fact would indicate that there is an unusual destruction of leucocytes going on, and we have further evidence of this in that the number of the lymphocytes (the youngest of the leucocytes) appears to be diminished while the transitional forms are increased in number. The proportion of the multinuclear leucocytes need not be altered, provided the death-rate of these (the oldest of the leucocytes) keeps pace with the rate of premature senility of the younger ones.

An interesting observation, although without any bearing on leucocytosis, is that in two experiments the amount of hemoglobin was diminished by the fever. The count of the red blood-corpuscles was not of sufficient accuracy in these cases to determine whether or not this was out of proportion to the change in the number of these cells.

Having failed to find any numerical change in the leucocytes in simple thermic fever, it seemed desirable to study the blood of some other fever not accompanied by the presence of bacteria in the organism. For this purpose peptone fever was selected, and the following experiments performed:

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EXPERIMENT I.—Large black dog.

2 P.M. . . . . R. B. C., 7,450,000
W. B. C., 21,800
3 P.M. . . . . R. B. C., 7,800,000
Rectal temperature = 39.0° C. . . . . W. B. C., 18,750
3.45 P.M. Finished injecting 2 grammes peptone (Witte's) into jugular vein.
3.50 P.M. . . . . R. B. C., 8,400,000
Rectal temperature = 39.0° C. . . . . W. B. C., 6,250
4.15 P.M. . . . . R. B. C., 8,500,000
Rectal temperature = 40.4° C. . . . . W. B. C., 3,500
4.45 P.M. . . . . R. B. C., 7,300,000
W. B. C., 12,000
5.45 P.M. . . . . R. B. C., 7,640,000
Rectal temperature = 40.9° C. . . . . W. B. C., 10,250
9 P.M. . . . . R. B. C., 8,000,000
Rectal temperature = 40.0° C. . . . . W. B. C., 18,300

EXPERIMENT II.—Dog of medium size.

12 noon . . . . . R. B. C., 7,650,000
W. B. C., 20,300
12.30 P.M. . . . . R. B. C., 7,900,000
Rectal temperature = 39.2° C. . . . . W. B. C., 18,750
1.05 P.M. Injected into jugular vein, 1.5 grammes peptone (Witte's).
2.30 P.M. . . . . R. B. C., 8,730,000
Rectal temperature = 40.7° C. . . . . W. B. C., 9,375
3.30 P.M. . . . . R. B. C., 8,200,000
Rectal temperature = 40.6° C. . . . . W. B. C., 12,500
5.30 P.M. . . . . R. B. C., 7,400,000
Rectal temperature = 40.3° C. . . . . W. B. C., 9,300
This dog seemed very sick for a time. The intoxication was much more severe than in any other experiments in which peptone was injected.

EXPERIMENT III.—Small dog.

2 P.M. . . . . R. B. C., 7,400,000
Hb = 110 per cent. . . . . W. B. C., 11,000
3 P.M. . . . . R. B. C., 8,000,000
Hb = 108 per cent.; rectal temperature = 38.8° C.
W. B. C., 40,000
3.20 P.M. Injected into jugular vein 1 gramme peptone (Witte's).
4.30 P.M. . . . . R. B. C., 8,200,000
Rectal temperature = 39.5° C.; Hb = 108 per cent.
W. B. C., 14,000
5.20 P.M. . . . . R. B. C., 8,350,000
Rectal temperatur = 39.4° C. . . . . W. B. C., 12,500
Next day . . . . . R. B. C., 6,750,000
Hb = 105 per cent. . . . . W. B. C., 18,750

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EXPERIMENT IV.—Small dog.

12.30 P.M. . . . . R. B. C., 7,400,000
W. B. C., 18,750
1 P.M. . . . . R. B. C., 7,050,000
W. B. C., 25,000
2 P.M. . . . . R. B. C., 7,200,000
Rectal temperature = 38.0° C. . . . . W. B. C., 22,000
5.05 P.M. Injected into jugular vein 1 gramme peptone (Lehn and Fink's).
5.10 P.M. Severe purging, great prostration. This peptone seems much more toxic than the other.
5.20 P.M. . . . . R. B. C., 6,675,000
W. B. C., 9,400
6 P.M., ... R. B. C., 8,000,000
W. B. C., 12,000
9 P.M. . . . . R. B. C., 7,800,000
Rectal temperature = 38.8° C. . . . . W. B. C., 23,400
Dog still seems ill, but is not as weak and sick as he was immediately after the injection.

These experiments show a fever without any increase in the number of leucocytes. There is a very pronounced reduction in the number of leucocytes immediately after the injection, from which there is a gradual return to the normal. This is in accord with the experiments of Wright. The fever appears to bear no relation to the number of leucocytes, as it comes on while these cells are diminished in number, and is not altered as they return to the normal number. It seems highly probable that this diminution of the leucocytes is the result of the injection of highly toxic albumoses contained in commercial peptone, or at least is not caused by the pyrexia.

It has been found by Kanthack and Hankin that the injection of micro-organisms causes a fever in a very short time, and that leucocytosis appears later when the fever is falling. I have confirmed this by experiments which will be mentioned later.

The second condition existent in infections, mentioned above, as a possible factor in the production of leucocytosis is that of altered coagulability.

The experiments made with different peptones show us how the blood of an animal may have its coagulability greatly lessened by peptone without any increase of the leucocytes and only a transient diminution of these cells.

Clinically we find that those diseases which present the greatest increase in the coagulability of the blood (pneumonia, diphtheria, and erysipelas) show a very decided leucocytosis.

It is found, however, that the increase in the fibrin factors is much more constant than the increase in the number of leucocytes.

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The following experiments were made to determine what effect the injection of nuclein and calcium chloride would have on the leucocytes. The time was so fully occupied by counting corpuscles that the degree of coagulability could not be determined in all the experiments. It is a well-established fact, however, that the injection of these substances causes an increased coagulability of the blood. When given, the method recommended by Wright[1] was employed.

EXPERIMENT I.—Pup weighing 4.988 kilos.

2 P.M. . . . . R. B. C., 6,450,000
W. B. C., 12,500
2.30 P.M. . . . . W. B. C., 12,500
3 P.M. Injected (slowly) per jugular vein, 15 cubic centimetres nuclein, diluted with normal salt solution.
3.05 P.M. . . . . R. B. C., 6,400,000
No white corpuscles could be seen anywhere in counting the corpuscles. In a stained, fixed preparation a few were found, the multinuclear predominating and other forms being present.
3.20 P.M. . . . . R. B. C., 6,500,000
W. B. C., 6,250
3.45 P.M. . . . . W. B. C., 4,700
4.15 P.M. . . . . W. B. C., 6,250

EXPERIMENT II.—Small dog; weight = 7.256 kilos.

1 P.M. . . . . R. B. C., 7,250,000
W. B. C., 18,750
2 P.M. . . . . R. B. C., 7,500,000
Rectal temperature = 38.7° C. . . . . W. B. C., 21,800
3.30 P.M. Coagulation time = 1 minute 15 seconds.
3.55 P.M. Injected, per jugular, 10 cubic centimetres nuclein,[2] diluted with 20 cubic centimetres normal salt solution.
4 P.M. . . . . R. B. C., 5,210,000
W. B. C., 10,900
4.10 P.M. Coagulation time = 1 minute 15 seconds.
4.25 P.M. . . . . R. B. C., 6,900,000
W. B. C., 10,900
4.55 P.M. Rectal temperature = 39.0° C.
5.10 P.M. Coagulation time = 1 minute 15 seconds.
5.15 P.M. . . . . R. B. C., 7,150,000
W. B. C., 18,750

EXPERIMENT III.—Dog; weight = 10.23 kilos.

12 noon . . . . . R. B. C., 5,650,000
W. B. C., 15,600
12.30 P.M. . . . . R. B. C., 5,700,000
Coagulation time = 1 minute 45 seconds . . . W. B. C., 17,000

[1] British Med. Journ., July 29, 1893.

[2] I am indebted to Dr. John H. Musser and to Dr. S. Solis Cohen for this nuclein, which was prepared and given to them by Professor V. C. Vaughan, of the University of Michigan.

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3.35 P.M. Injected into jugular vein, 25 cubic centimetres 2-per-cent. solution calcium chloride.
3.40 P.M. . . . . W. B. C., 25,000
3.45 P.M. Injected 25 cubic centimetres (slowly).
3.52 P.M. Coagulation time = 1 minute 15 seconds.
4 P.M. Injected 30 cubic centimetres.
4.05 P.M. . . . . R. B. C., 5,800,000
W. B. C., 23,450
4.10 Coagulation time = 1 minute 10 seconds.
4.45 P.M. . . . . R. B. C., 5,500,000
Coagulation time = 58 seconds . . . . . W. B. C., 28,100

EXPERIMENT IV.—Dog; weight = 10.203 kilos.

2 P.M. . . . . R. B. C., 6,600,000
W. B. C., 15,600
4 P.M. . . . . R. B. C., 7,000,000
Coagulation time = 1 minute 15 seconds . . . W. B. C., 12,500
4.15–4.25 P.M. Injected slowly, per jugular, 150 cubic centimetres of 2.5-per-cent. solution of calcium chloride.
4.25 P.M. . . . . W. B. C., 17,180
4.30–4.45 P.M. Injected 62 cubic centimetres 5-per-cent. solution calcium chloride.
4.45–4.50 P.M. Injected 38 cubic centimetres 5-per-cent. solution.
6 P.M. . . . . R. B. C., 6,700,000
Coagulation time = 1 minute . . . . . W. B. C., 12,500

These experiments, though too few in number to state positively just what effect nuclein and calcium chloride have upon leucocytes, are sufficient at least to show that the injection of these substances does not cause leucocytosis.

When nuclein was injected there was a temporary diminution in the number of leucocytes with a gradual return to the normal, while the coagulability was not materially changed; when calcium chloride was injected the coagulability was distinctly increased with scarcely any change in the number of leucocytes.

When the alkalinity of the blood is changed in the infections, it is usually diminished. We have already considered this question of lessened alkalinity of the blood when speaking of the leucocytosis of cachectic states, and found that this condition, produced experimentally, fails to cause any leucocytosis.

Having failed, therefore, to find an explanation of leucocytosis in any of the conditions mentioned above, we are narrowed down to the effect of the toxic substances produced by the micro-organisms causing the disease.

As negative evidence, however, fails to carry conviction, we must try to find position and direct evidence on this point.

Everard, Demoor, and Massart,[1] working in the University of

[1] Annales de l'Institut Pasteur, February 25, 1893.

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Brussels, have made an elaborate study of the modifications of the leucocytes in infection and immunity.

Their experiments were made upon guinea-pigs and rabbits. The changes which they observed occurred chiefly in the multinuclear forms, and unless otherwise stated it will be understood these are the leucocytes affected. In the following summary of their work the terms hypo- and hyperleucocytosis are used (as in the original paper) to designate a diminution and increase of the leucocytes respectively:

I. VIBRIO OF METSCHNIKOFF.

(*a*) *Injection of cultures heated to 100° C.*

(1) In fresh guinea-pigs there is first a hypoleucocytosis soon followed by hyperleucocytosis.

(2) In guinea-pigs vaccinated against the vibrio of Metschnikoff there was hyperleucocytosis.

(*b*) *Injection of cultures filtered but not heated.*

(1) In fresh guinea-pigs there was a transient hypoleucocytosis followed by hyperleucocytosis.

(2) In vaccinated guinea-pigs there was hyperleucocytosis from the first.

(*c*) *Injection of virulent, living micro-organisms.*

(1) Of four fresh guinea-pigs two died and two recovered. The two which recovered showed a hypoleucocytosis followed by hyperleucocytosis. One that died showed hypoleucocytosis up to death. The other showed hypoleucocytosis followed by hyperleucocytosis.

(2) Four guinea-pigs vaccinated against the disease showed distinct hypoleucocytosis followed by a great hyperleucocytosis.

II. BACILLUS OF HOG CHOLERA.

Virulent living cultures.

(1) In fresh rabbits hypoleucocytosis was observed increasing up to death. In fresh rabbits which withstood the inoculation and recovered there was seen a hypoleucocytosis followed by hyperleucocytosis.

(2) In vaccinated animals there was hyperleucocytosis in a short time after inoculation. The blood was observed to be rich in multinuclear leucocytes before the inoculation.

III. STAPHYLOCOCCUS PYOGENES AUREUS.

(*a*) *Rabbits.*

(1) In those in which death was caused there was little change for twenty-two hours, except a decrease of multinuclear forms. Then there was hypoleucocytosis.

(2) In those resisting the infection there was hyperleucocytosis in eight hours.

(*b*) *Guinea-pigs.*

Total number not changed.

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IV. ANTHRAX BACILLUS.

(*a*) *Rabbits.*

(1) Fresh rabbits, hypoleucocytosis till death.

(2) Immunized rabbits. Before the injection there was a hyperleucocytosis. Following the injection there was a transient hypoleucocytosis which rapidly disappeared, and blood returned to condition present before injection.

(*b*) *Guinea-pigs.*

(1) Fresh. Hypoleucocytosis alternating with slight hyperleucocytosis up to death.

(2) Animal immune to the vibrio of Metschnikoff. Blood rich in multinuclear forms before injection. Hypoleucocytosis alternating with hyperleucocytosis up to death. Death occurred when blood was rich in multinuclear forms.

V. BACILLUS OF TETANUS.

(*a*) *Fresh rabbits injected with attenuated culture.*

There was immediately a diminution of the multinuclear forms, but no change in number. Later, hyperleucocytosis appeared, lasted two days, when the blood returned to normal.

(*b*) *Guinea-pigs.*

(1) Fresh: Hypoleucocytosis alternating with hyperleucocytosis until death.

(2) Animals immune to vibrio of Metschnikoff. Blood rich in multinuclear leucocytes. There was a temporary hypoleucocytosis followed by hyperleucocytosis which lasted almost till death. At time of death the multinuclear leucocytes were abundant.

VI. BACILLUS MYCOIDES (NON-PATHOGENIC).

(*a*) *Rabbits.*

Slight hypo- followed by a slight hyperleucocytosis. Proportion of multinuclear leucocytes increased.

(*b*) *Guinea-pigs.*

Slight hypo- and hyperleucocytosis.

From these results they conclude that, in case the animal succumbs to the infection, there is generally a distinct hypoleucocytosis, increasing up to death. In animals not completely immune this is not strictly true, for there is then a fluctuation between hypo- and hyperleucocytosis,—a struggle between the disease and the resistance of the animal. Hyperleucocytosis is present when the animals survive the injection,—whether the material injected be living cultures, filtered products free from bacteria, or cultures heated to 100° C.

Hyperleucocytosis is most marked when virulent cultures are used, and least marked when non-pathogenic bacteria are injected. In all cases of hyperleucocytosis there are observed many multinuclear

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cells breaking down, liberating granules and nuclei, which show a tendency to become grouped together.

In animals made immune in any way there is a decided hyperleucocytosis, with a great preponderance of the multinuclear forms. Subsequent inoculation in such animals shows only slight hypoleucocytosis.

Animals made immune to one disease and later infected with another exhibit the same phenomena as a fresh animal, except that death takes place at a time when there are many multinuclear leucocytes in the blood,—a condition never seen in fresh animals when death comes on.

Kanthack[1] and Hankin have found that following the injection of the bacillus pyocyaneus or its bacterial product separated from the bacilli, and the vibrio of Metschnikoff, there is immediately a diminution of leucocytes in the blood. Following this, leucocytosis appears at a time when the fever is falling, and often continues after the temperature has fallen to the norm.

They also claim that the eosinophiles are greatly increased, while the neutrophiles are scarcely at all increased. These eosinophiles are not phagocytic, and hence an increase in the number of these cells must be for some other purpose than that of phagocytosis.

Rieder and others have also shown a transient diminution with a subsequent increase of leucocytes following the injection of bacteria. The following experiments were undertaken with the bacillus pyocyaneus and with the bacillus diphtheriæ in order to determine what effect fatal and non-fatal doses would have, and also what effect immunity has upon the leucocytes:

I. EXPERIMENTS WITH BACILLUS PYOCYANEUS.

Experiment I.—Rabbit of Medium Size.

February 8, 1894.

3.30 P.M. . . . . R. B. C., 5,137,500
W. B. C., 8,000

4 P.M. . . . . R. B. C., 5,050,000
W. B. C., 9,375

4.20 P.M. Injected subcutaneously 1 cubic centimetre bouillon culture bacillus pyocyaneus, three days old in incubator.

8 P.M. . . . . R. B. C., 5,120,000
W. B. C., 7,000

10 P.M. . . . . R. B. C., 5,125,000
W. B. C., 1,600

February 9, 1894.

1.30 A.M. . . . . R. B. C., 5,025,000
W. B. C., 3,900

8 A.M. . . . . R. B. C., 5,300,000
W. B. C., 4,700

11 A.M. . . . . W. B. C., 4,680

3 P.M. . . . . R. B. C., 5,080,000
W. B. C., 4,680

9 P.M. . . . . W. B. C., 6,000

12 midnight . . . . R. B. C., 5,200,000
W. B. C., 6,250

February 10, 1894.

10 A.M. . . . . R. B. C., 5,025,000
W. B. C., 3,900

3 P.M. . . . . R. B. C., 5,075,000
W. B. C., 5,400

February 11, 1894.

10 A.M. . . . . R. B. C., 5,125,000
W. B. C., 18,750

February 12, 1894.

12 M. . . . . R. B. C., 5,050,000

Died during night . W. B. C., 21,800

[1] British Medical Journal, Vol. 1, 1892, p. 1301.

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Experiment II.—Large Rabbit.

February 8, 1894.

2.30 P.M. . . . . R. B. C., 5,180,000
W. B. C., 10,900

3 P.M. . . . . R. B. C., 5,450,000
W. B. C., 7,000

3.30 P.M. Injected subcutaneously 1 cubic centimetre bouillon culture bacillus pyocyaneus, three days old in incubator.

4.30 P.M. . . . . R. B. C., 5,000,000
W. B. C., 7,500

7.30 P.M. . . . . R. B. C., 5,000,000
W. B. C., 4,700

9.30 P.M. . . . . R. B. C., 5,175,000
W. B. C., 14,060

February 9, 1894.

1 A.M. . . . . R. B. C., 5,200,000
W. B. C., 4,700

7.30 A.M. . . . . R. B. C., 5,250,000
W. B. C., 10,900

11 A.M. . . . . W. B. C., 7,800

3 P.M. . . . . R. B. C., 5,200,000
W. B. C., 3,125

9 P.M. . . . . W. B. C., 4,700

12 midnight . . . . R. B. C., 5,400,000
W. B. C., 4,700

February 10, 1894.

10.30 A.M. . . . . R. B. C., 5,350,000
W. B. C., 4,690

2.30 P.M. . . . . R. B. C., 5,300,000
W. B. C., 6,000

February 11, 1894.

9.30 A.M. . . . . R. B. C., 5,350,000
W. B. C., 7,800

February 15, 1894.

8 P.M. . . . . R. B. C., 5,400,000
W. B. C., 6,250

February 20, 1894.

R. B. C., 5,450,000
W. B. C., 30,000

Recovered. Used again in Experiment IV.

Experiment III.—Large Rabbit (Fresh).

February 20, 1894.

10.30 A.M. . . . . R. B. C., 6,050,000
W. B. C., 28,100

11 A.M. . . . . R. B. C., 5,850,000
W. B. C., 15,600

Rectal temperature = 38.8° C.

11.35 A.M. Injected into jugular vein 4 cubic centimetres bouillon culture bacillus pyocyaneus, two days old in incubator.

12.45 P.M. . . . . R. B. C., 5,640,000
W. B. C., 3,125

2 P.M. . . . . R. B. C., 5,400,000
W. B. C., 1,560

Rectal temperature = 41.4° C.

4 P.M. . . . . R. B. C., 5,000,000
W. B. C., 17,000

8 P.M. . . . . R. B. C., 5,500,000
W. B. C., 13,280

Rectal temperature = 40.6° C.

February 21, 1894.

1 A.M. . . . . R. B. C., 5,700,000
W. B. C., 6,250

Rectal temperature = 41.1° C.

11 A.M. . . . . R. B. C., 5,800,000
W. B. C., 4,680

10 P.M. . . . . R. B. C., 5,900,000
W. B. C., 7,800

Rectal temperature = 39.0° C.

Rabbit has aborted; is lying on side and cannot stand up; is apparently moribund; 12 midnight found dead.

Experiment IV.—Large Rabbit used in Experiment II.

February 20, 1894.

12.30 P.M. . . . . R. B. C., 5,450,000
W. B. C., 43,750

1 P.M. . . . . R. B. C., 5,550,000
W. B. C., 26,560

Rectal temperature = 37.5° C.

1.20 P.M. Injected into jugular vein 5 cubic centimetres bouillon culture bacillus pyocyaneus, two days old in incubator.

2.40 P.M. . . . . R. B. C., 5,350,000
W. B. C., 14,060

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Experiment IV.—Large Rabbit used in Experiment II.

4.20 P.M. . . . . R. B. C., 5,400,000
W. B. C., 7,810
8 P.M. . . . . R. B. C., 5,600,000
W. B. C., 6,200
February 21, 1894.
1 A.M. . . . . R. B. C., 5,300,000
W. B. C., 15,600
Rectal temperature = 39.7° C.
11 A.M. . . . . R. B. C., 5,600,000
W. B. C., 25,000
Rectal temperature = 39.8° C.
February 22, 1894.
11 A.M. . . . . R. B. C., 5,500,000
W. B. C., 10,900
Rabbit very ill; lying on side, cannot stand.
Rectal temperature = 37.2° C.
12 noon. Convulsion.
12.30 P.M. Died.

Experiment V.—Large Rabbit.

February 13, 1894.
5 P.M. Normal . . R. B. C., 5,400,000
W. B. C., 12,500
5.30 P.M. . . . . R. B. C., 5,050,000
W. B. C., 18,000
6 P.M. Injected subcutaneously 2 cubic centimetres bouillon culture bacillus pyocyaneus, heated to 65° C. for one hour. Culture three weeks old at room temperature.
February 16, 1894.
R. B. C., 5,000,000
W. B. C., 10,150
Injected 5 cubic centimetres three weeks old culture, heated to 68° C. for one hour.
February 17, 1894.
R. B. C., 4,900,000
W. B. C., 10,850
Injected 5 cubic centimetres bouillon culture bacillus pyocyaneus, heated to 68° C. (as above).
February 18, 1894.
R. B. C., 4,090,000
W. B. C., 9,400
Injected 2 cubic centimetres of above culture, heated to 68° C. for one hour.
February 20, 1894.
R. B. C., 5,087,000
W. B. C., 7,800
Injected 3 cubic centimetres of above culture, heated to 65.0° C. for one hour.

Experiment VI.—Small Rabbit (Fresh).

February 26, 1894.
4 P.M. . . . . R. B. C., 5,875,000
W. B. C., 9,250
4.30 P.M. . . . . R. B. C., 4,787,000
W. B. C., 7,800
5.50 P.M. Injected subcutaneously 2 cubic centimetres bouillon culture bacillus pyocyaneus, heated to 60° C. for one hour. Culture six days old at room temperature.
February 27, 1894.
4 P.M. . . . . R. B. C., 5,225,000
W. B. C., 17,200
Injected 2 cubic centimetres culture used above, heated to 65° C. for one-half hour.
February 28, 1894.
R. B. C., 5,080,000
W. B. C., 11,000
March 1, 1894.
R. B. C., 5,300,000
W. B. C., 13,000
Injected 2 cubic centimetres eight days old culture, heated to 65° C. for one hour.
Found dead next morning.
As two other rabbits were found dead in the cage at the same time without any apparent cause, it is doubtful if the animal died as a result of the experiment.

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Experiment VII.—Large White Rabbit.

February 26, 1894.

3 P.M. . . . . R. B. C., 4,600,000
W. B. C., 7,100

3.45 P.M. . . . . R. B. C., 4,800,000
W. B. C., 9,200

5 P.M. Injected subcutaneously 2 cubic centimetres bouillon culture bacillus pyocyaneus (six days old), heated to 60° C., one hour.

February 27, 1894.

. . . . . R. B. C., 5,150,000
W. B. C., 7,000

Injected 2 cubic centimetres, culture heated to 65° C. for thirty minutes.

February 28, 1894.

. . . . . R. B. C., 5,250,000
W. B. C., 7,800

March 1, 1894.

. . . . . R. B. C., 5,375,000
W. B. C., 6,200

Injected 2 cubic centimetres eight days old culture, heated to 65° C. for one hour.

March 5, 1894.

3.30 P.M. . . . . R. B. C., 5,300,000
W. B. C., 4,700

4 P.M. . . . . R. B. C., 5,000,000
W. B. C., 9,200

4.30 P.M. Etherized. Injected into jugular vein 5 cubic centimetres bouillon culture bacillus pyocyaneus culture five days old in incubator.

6 P.M. . . . . R. B. C., 5,350,000
W. B. C., 17,200

Rectal temperature = 38.4° C.

8 P.M. . . . . R. B. C., 5,087,000
W. B. C., 11,000

Rectal temperature = 40.0° C.

11 P.M. . . . . R. B. C., 5,200,000
W. B. C., 14,000

Rectal temperature = 39.7° C.

12 midnight . . . . R. B. C., 4,950,000
W. B. C., 12,500

March 6, 1894.

10 A.M. . . . . R. B. C., 5,038,000
W. B. C., 18,000

3 P.M. . . . . R. B. C., 5,200,000
W. B. C., 34,000

Rectal temperature = 39.4° C.

7 P.M. . . . . R. B. C., 5,300,000
W. B. C., 23,500

12 midnight . . . . R. B. C., 4,900,000
W. B. C., 28,900

March 7, 1894.

10 A.M. . . . . R. B. C., 5,300,000
W. B. C., 20,500

Seems well.

March 8, 1894.

Animal found dead.

Experiment VIII.—Rabbit of Medium Size.

March 20, 1894.

3.30 P.M. . . . . R. B. C., 6,200,000
W. B. C., 6,400

4 P.M. . . . . R. B. C., 5,800,000
W. B. C., 7.800

5 P.M. Injected subcutaneously 5 cubic centimetres bouillon culture bacillus pyocyaneus one month old at room temperature, solution heated to 55° C. for fifteen minutes.

March 21, 1894.

. . . . . R. B. C., 5,500,000
W. B. C., 6,250

Injected 3 cubic centimetres as above, heated to 55° C. for fifteen minutes.

March 22, 1894.

. . . . . R. B. C., 5,600,000
W. B. C., 10,200

Injected 5 cubic centimetres as above, heated to 55° C. for fifteen minutes.

March 23, 1894.

. . . . . R. B. C., 6,000,000
W. B. C., 6,250

Injected 3 cubic centimetres as above.

March 24, 1894.

. . . . . R. B. C., 5,600,000
W. B. C., 7,800

Injected 5 cubic centimetres as above.

March 25, 1894.

. . . . . R. B. C., 5,650,000
W. B. C., 12,500

Injected 7 cubic centimetres as above.

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March 26, 1894.

10.30 A.M. . . . . R. B. C., 5,825,000
W. B. C., 12,500

11 A.M. . . . . R. B. C., 5,950,000
W. B. C., 10,900

Rectal temperature = 39.8° C.

11.30 A.M. Injected into jugular vein 3 cubic centimetres bouillon culture bacillus pyocyaneus.

12.30 P.M. . . . . R. B. C., 6,100,000
W. B. C., 3,280

Rectal temperature = 41.0° C.

Coagulability of the blood appears to be greatly increased.

2 P.M. . . . . R. B. C., 6,000,000
W. B. C., 8,500

Rectal temperature = 41.1° C.

3 P.M. . . . . R. B. C., 6,200,000
W. B. C., 26,500

Animal lively and eats freely.

4.30 P.M. . . . . R. B. C., 5,050,000
W. B. C., 38,120

Rectal temperature = 40.1° C.

6.30 P.M. . . . . R. B. C., 5,600,000
W. B. C., 74,200

Rectal temperature = 39.8° C.

8 P.M. . . . . R. B. C., 5,555,000
W. B. C., 72,000

Rectal temperature = 39.9° C.

11.30 P.M. . . . . R. B. C., 5,700,000
W. B. C., 79,700

Rectal temperature = 39.8° C.

March 27, 1894.

8 A.M. . . . . R. B. C., 6,000,000
W. B. C., 35,900

Temperature 39.8° C.

12 noon . . . . . R. B. C., 5,700,000
W. B. C., 21,800

8 P.M. . . . . R. B. C., 5,500,000
W. B. C., 18,800

March 28, 1894.

. . . . . R. B. C., 5,350,000
W. B. C., 10,900

March 29, 1894.

10 A.M. . . . . R. B. C., 6,000,000
W. B. C., 20,300

10.30 A.M. . . . . R. B. C., 5,300,000
W. B. C., 28,100

1.30 P.M. Injected subcutaneously 2.5 cubic centimetres bouillon solution of bacillus diphtheriæ on blood serum, one week old at room temperature.

5 P.M. . . . . R. B. C., 5,240,000
W. B. C., 20,300

10.30 P.M. . . . . R. B. C., 5,125,000
W. B. C., 21,875

March 30, 1894.

8 A.M. . . . . R. B. C., 5,350,000
W. B. C., 6,250

11 A.M. . . . . R. B. C., 5,650,000
W. B. C., 9,350

4 P.M. . . . . R. B. C., 5,400,000
W. B. C., 7,800

10 P.M. . . . . R. B. C., 5,300,000
W. B. C., 14,000

March 31, 1894.

10 A.M. . . . . R. B. C., 5,575,000
W. B. C., 12,500

2 P.M. . . . . .
W. B. C., 12,500

II. EXPERIMENTS WITH BACILLUS DIPHTHERIÆ.

Experiment I.—Half-grown Rabbit.

11 A.M. . . . . R. B. C., 4,800,000
W. B. C., 12,500

11.30 A.M. . . . . R. B. C., 4,900,000
W. B. C., 15,600

2.30 P.M. Injected subcutaneously four cubic centimetres of bouillon solution of bacillus diphtheriæ on blood serum, one week old; taken from very malignant case of diphtheria.

5 P.M. . . . . R. B. C., 4,500,000
W. B. C., 7,800

10 P.M. . . . . R. B. C., 4,650,000
W. B. C., 12,500

Next day found dead.

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Experiment II.—Half-grown Rabbit.

12 noon. . . . . R. B. C., 4,300,000
W. B. C., 25,000

12.30 P.M. . . . . R. B. C., 4,600,000
W. B. C., 29,800

1.30 P.M. Injected subcutaneously 2.5 cubic centimetres bouillon solution of bacillus diphtheriæ, as in Experiment I.

5 P.M. . . . . R. B. C., 4,400,000
W. B. C., 10,930

8 P.M. . . . . R. B. C., 4,100,000
W. B. C., 15,600

Died during night.

Experiment III.—Rabbit of Medium Size.

March 15, 1894.

3.30 P.M. . . . . R. B. C., 6,325,000
W. B. C., 7,810

4 P.M. . . . . R. B. C., 6,250,000
W. B. C., 12,500

6 P.M. Injected subcutaneously 5 cubic centimetres bouillon culture of bacillus diphtheriæ, two days old, in incubator.

10 P.M. . . . . R. B. C., 5,750,000
W. B. C., 7,800

March 16, 1894.

10 A.M. . . . . R. B. C., 5,400,000
W. B. C., 3,125

5 P.M. . . . . R. B. C., 4,650,000
W. B. C., 6,250

March 17, 1894.

3 P.M. . . . . R. B. C., 5,000,000
W. B. C., 6,250

March 18, 1894.

3 P.M. . . . . R. B. C., 5,000,000
W. B. C., 6,250

Animal showed no symptoms up to this date.

March 22, 1894.

10 P.M. . . . . R. B. C., 5,000,000
W. B. C., 15,000

This is the first time the animal has shown any effect from injection. Was found lying on side at this time, very weak, and completely paraplegic. Respirations very rapid.

March 24, 1894.

Found dead this morning.

Experiment IV.—Rabbit of Medium Size.

March 15, 1894.

2 P.M. . . . . R. B. C., 5,175,000
W. B. C., 9,400

2.30 P.M. . . . . R. B. C., 4,900,000
W. B. C., 14,000

5.30 P.M. Injected subcutaneously five cubic centimetres bouillon culture of bacillus diphtheriæ, two days old, in incubator. (The micro-organism had been shown to be pathogenic by previous injection of guinea-pigs.)

March 16, 1894.

10.30 A.M. . . . . R. B. C., 4,500,000
W. B. C., 7,000

5.30 P.M. . . . . R. B. C., 4,525,000
W. B. C., 3,100

March 17, 1894.

3 P.M. . . . . R. B. C., 4,250,000
W. B. C., 9,000

March 18, 1894.

3 P.M. . . . . R. B. C., 4,300,000
W. B. C., 7,800

March 22, 1894.

10 P.M. Found dead. Had shown absolutely no symptoms previous to this date, and could not have been sick for a very long time, as he did not attract attention when seen in the morning of this date.

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Experiment V.—Large White Rabbit.

March 2, 1894.
Normal . . . . . R. B. C., 5,040,000
W. B. C., 7,000
Normal . . . . . R. B. C., 4,840,000
W. B. C., 7,800
Injected subcutaneously 2 cubic centimetres bouillon solution of bacillus diphtheriæ on blood serum, three weeks old (in dark).

March 4, 1894.
. . . . . R. B. C., 4,500,000
W. B. C., 25,000
March 5, 1894.
. . . . . R. B. C., 4,300,000
W. B. C., 17,000
March 6, 1894.
. . . . . R. B. C., 4,600,000
W. B. C., 18,000
Recovery.

Experiment VI.

March 2, 1894.
Normal . . . . . R. B. C., 4,600,000
W. B. C., 10,100
Normal . . . . . R. B. C., 4,750,000
W. B. C., 11,000
Injected 2 cubic centimetres bouillon solution of bacillus diphtheriæ on blood serum, three weeks old (in dark).

March 4, 1894.
. . . . . R. B. C., 4,000,000
W. B. C., 60,600
March 5, 1894.
. . . . . R. B. C., 4,200,000
W. B. C., 25,800
March 6, 1894.
. . . . . R. B. C., 4,275,000
W. B. C., 16,500
Recovered.

Experiment VII.—Medium Sized Rabbit.

March 1, 1894.
Normal . . . . . R. B. C., 5,150,000
W. B. C., 6,250
Normal . . . . . R. B. C., 5,100,000
W. B. C., 7,000
3 P.M. Injected subcutaneously culture of bacillus diphtheriæ on blood serum (two days old).

March 2, 1894.
. . . . . R. B. C., 5,200,000
W. B. C., 10,160
March 3, 1894.
. . . . . R. B. C., 4,875,000
W. B. C., 12,500
March 4, 1894.
. . . . . R. B. C., 4,850,000
W. B. C., 18,700
March 7, 1894.
. . . . . R. B. C., 4,212,000
W. B. C., 9,350
Very lively.
. . . . . R. B. C., 4,125,000
W. B. C., 11,700

5 P.M. Injected subcutaneously 2 cubic centimetres bouillon solution of bacillus diphtheriæ, five days old on blood serum. (Same culture killed a guinea-pig in forty-two hours.)

March 8, 1894.
. . . . . R. B. C., 4,875,000
W. B. C., 28,100
March 9, 1894.
. . . . . R. B. C., 4,900,000
W. B. C., 22,600
March 10, 1894.
. . . . . R. B. C., ———
W. B. C., 25,800
March 11, 1894.
. . . . . R. B. C., 5,200,000
W. B. C., 18,000
March 13, 1894.
. . . . . R. B. C., 5,000,000
W. B. C., 8,650
Recovered.

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Experiment VIII.—Small Rabbit.

March 1, 1894.
Normal . . . . . R. B. C., 5,750,000
W. B. C., 6,250
Normal . . . . . R. B. C., 5,480,000
W. B. C., 5,450
3 P.M. Injected as in Experiment VII.
March 2, 1894.
12 noon . . . . . R. B. C., 5,225,000
W. B. C., 21,900
Some edema at seat of inoculation.
March 3, 1894.
. . . . . R. B. C., 5,700,000
W. B. C., 21,850
March 4, 1894.
. . . . . R. B. C., 5,000,000
W. B. C., 11,700
March 7, 1894.
. . . . . R. B. C., 5,140,000
W. B. C., 8,600
. . . . . R. B. C., 5,200,000
W. B. C., 7,800
5 P.M. Injected 2 cubic centimetres bouillon solution, same culture as used in Experiment VII.
March 8, 1894.
4 P.M. . . . . R. B. C., 4,837,000
W. B. C., 11,000
March 9, 1894.
. . . . . R. B. C., 5,100,000
W. B. C., 34,300
March 10 1894.
. . . . . R. B. C., ———
W. B. C., 25,000
March 12, 1894.
. . . . . R. B. C., 5,075,000
W. B. C., 21,000
Recovered.

Experiment IX.—Full Grown Rabbit.

March 1, 1894.
Normal . . . . . R. B. C., 4,950,000
W. B. C., 4,000
. . . . . R. B. C., 5,090,000
W. B. C., 5,470
Inoculated as in Experiment VII.
March 2, 1894.
. . . . . R. B. C., 4,800,000
W. B. C., 23,400
Edema at point of inoculation.
March 3, 1894.
. . . . . R. B. C., 4,612,000
W. B. C., 25,000
March 4, 1894.
. . . . . R. B. C., 4,725,000
W. B. C., 49,200
Seems quite ill; edema persists.
March 5, 1894.
. . . . . R. B. C., 4,525,000
W. B. C., 15,600
March 7, 1894.
. . . . . R. B. C., 4,475,000
W. B. C., 6,250
5 P.M. Injected 2 cubic centimetres, same solution as used in Experiments VII and VIII.
March 8, 1894.
. . . . . R. B. C., 4,575,000
W. B. C., 23,450
March 9, 1894.
. . . . . R. B. C., 4,800,000
W. B. C., 36,700
March 10, 1894.
. . . . . R. B. C., ———
W. B. C., 54,700
March 12, 1894.
. . . . . R. B. C., 5,000,000
W. B. C., 20,300
Recovered.

Experiment X.—Rabbit of Medium Size.

April 2, 1894.
4 P.M. . . . . R. B. C., 5,025,000
W. B. C., 14,000
. . . . . R. B. C., 5,125,000
W. B. C., 12,500
5 P.M. Injected 4 cubic centimetres bouillon solution of bacillus diphtheriæ, two weeks old on blood serum. Solution heated to 68° C. for one hour.

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Experiment X.—Rabbit of Medium Size.

April 3, 1894.
. . . . . R. B. C., 5,000,000
W. B. C., 22,650

April 5, 1894.
. . . . . R. B. C., 4,850,000
W. B. C., 8,600

Injected 3 cubic centimetres as above, heated to 68° C.

April 6, 1894.
. . . . . R. B. C., 5,000,000
W. B. C., 9,400

Injected 3 cubic centimetres as above, heated to 68° C.

April 7, 1894.
. . . . . R. B. C., 4,950,000
W. B. C., 8,000

Injected 2 cubic centimetres buillon solution of bacillus diphtheriæ on blood serum three weeks old. Solution heated to 68° C.

April 9, 1894.
. . . . . R. B. C., 4,600,000
W. B. C., 12,500

Experiment XI.—Large White Rabbit.

April 2, 1894.
Normal . . . . . R. B. C., 5,000,000
W. B. C., 17,000
Normal . . . . . R. B. C., 4,700,000
W. B. C., 12,500

5 P.M. Injected 4 cubic centimetres bouillon solution, heated to 68° C. for one hour.

April 3, 1894.
5 P.M. . . . . R. B. C., 4,800,000
W. B. C., 12,500

April 5, 1894.
. . . . . R. B. C., 4,875,000
W. B. C., 11,700

Injected 2 cubic centimetres as in Experiment VIII, heated to 68° C.

April 6, 1894.
. . . . . R. B. C., 5,000,000
W. B. C., 11,700

Injected 3 cubic centimetres buillon solution, as in Experiment X, at the same time.

April 7, 1894.
. . . . . R. B. C., 4,900,000
W. B. C., 11,700

Injected 2 cubic centimetres, heated to 68° C. as in Experiment X.

April 9, 1894.
. . . . . R. B. C., 4,800,000
W. B. C., 10,900

Experiment XII.—Large Healthy Rabbit.

April 10, 1894.
Normal . . . . . R. B. C., 4,350,000
W. B. C., 7,800
Second count . . . R. B. C., 4,325,000
W. B. C., 9,370

7.30 P.M. Injected 2.5 cubic centimetres bouillon solution bacillus diphtheriæ from blood-serum tube three weeks old. Solution heated to 55° C. for fifteen minutes. Blood serum culture was very malignant, killing a small rabbit in twenty-four hours.

April 11, 1894.
. . . . . R. B. C., 4,700,000
W. B. C., 6,250

5.30 P.M. Injected 2.5 cubic centimetres as above, heated to 55° C., for fifteen minutes.

April 12, 1894.
6 P.M. . . . . R. B. C., 4,400,000
W. B. C., 6,250

April 13, 1894.
10 A.M. . . . . R. B. C., 4,650,000
W. B. C., 7,800

Injected 2.5 cubic centimetres as above.

April 14, 1894.
3 P.M. . . . . R. B. C., 4,500,000
W. B. C., 9,300

Injected 2.5 cubic centimetres.

April 15, 1894.
10 P.M. . . . . R. B. C., 4,800,000
W. B. C., 6,250

April 16, 1894.
10 A.M. . . . . R. B. C., 4,700,000
W. B. C., 4,700

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Experiment XII.—Large Healthy Rabbit.

Injected 3 cubic centimetres bouillon solution as above, heated to 58° C. for thirty minutes.

April 17, 1894.

R. B. C., 4,600,000
W. B. C., 7,800

Injected 2.5 cubic centimetres solution, heated to 58° C. for thirty minutes.

April 18, 1894.

10 A.M. . . . . R. B. C., 4,400,000
W. B. C., 11,000

10.30 A.M. . . . . R. B. C., 4,775,000
W. B. C., 17,000

10.35 A.M. Injected 5 cubic centimetres bouillon solution virulent diphtheriæ cultivated on blood serum. Culture four days old. Proved to be pathogenic by injection of half-grown rabbit.

11.30 A.M. . . . . R. B. C., 5,050,000
W. B. C., 4,700

Coagulability of blood increased.

1 P.M. . . . . R. B. C., 4,450,000
W. B. C., 15,600

4 P.M. . . . . R. B. C., 4,325,000
W. B. C., 10,900

Seems very ill; will not eat.

8 P.M. . . . . R. B. C., 4,375,000
W. B. C., 25,000

10.30 P.M. . . . . R. B. C., 4,325,000
W. B. C., 20,300

April 19, 1894.

8.30 A.M. . . . . R. B. C., 4,550,000
W. B. C., 31,200

11.30 A.M. . . . . R. B. C., 4,500,000
W. B. C., 46,800

2 P.M. . . . . R. B. C., 4,475,000
W. B. C., 34,370

6 P.M. . . . . R. B. C., 4,100,000
W. B. C., 28,000

April 20, 1894.

9 A.M. . . . . R. B. C., 4,275,000
W. B. C., 17,300

2 P.M. . . . . R. B. C., 4,025,000
W. B. C., 18,750

9 P.M. . . . . R. B. C., 4,050,000
W. B. C., 20,000

April 21, 1894.

12 noon . . . . . R. B. C., 4,325,000
W. B. C., 12,500

5 P.M. . . . . R. B. C., 4,075,000
W. B. C., 10,900

Animal recovered.

Experiment XIII.—Large Healthy Rabbit.

April 10, 1894.

Normal . . . . . R. B. C., 4,425,000
W. B. C., 17,000

. . . . . R. B. C., 4,825,000
W. B. C., 11,000

7.45 P.M. Injected 2.5 cubic centimetres, same solution as used in Experiment XII, heated to 55° C. for fifteen minutes.

April 11, 1894.

11 A.M. . . . . R. B. C., 4,900,000
W. B. C., 12,500

5.45 P.M. Injected 2.5 cubic centimetres solution used in Experiment XII.

April 12, 1894.

. . . . . R. B. C., 5,100,000
W. B. C., 14,000

April 13, 1894.

. . . . . R. B. C., 4,900,000
W. B. C., 18,700

Injected 2.5 cubic centimetres as above.

April 14, 1894.

. . . . . R. B. C., 5,200,000
W. B. C., 21,000

Injected 3 cubic centimetres as above.

April 15, 1894.

. . . . . R. B. C., 5,000,000
W. B. C., 12,500

April 16, 1894.

. . . . . R. B. C., 4,850,000
W. B. C., 10,900

Injected 3 cubic centimetres bouillon solution as above, heated to 58° C. for thirty minutes.

April 17, 1894.

. . . . . R. B. C., 4,725,000
W. B. C., 9,400

Injected 2.5 cubic centimetres as April 16, 1894.

April 18, 1894.

9 A.M. . . . . R. B. C., 5,075,000
W. B. C., 9,400

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Experiment XIII.—Large Healthy Rabbit.

9.30 A.M. . . . . R. B. C., 4,800,000
W. B. C., 14,000

10.40 A.M. Injected 5 cubic centimetres bouillon solution virulent bacillus diphtheriæ, as in Experiment XII.

12 noon . . . . . R. B. C., 5,200,000
W. B. C., 3,120

1.20 P.M. . . . . R. B. C., 5,050,000
W. B. C., 25,000

3.30 P.M. . . . . R. B. C., 4,850,000
W. B. C., 21,900

Seems very sick.

7 P.M. . . . . R. B. C., 4,700,000
W. B. C., 17,200

10 P.M. . . . . R. B. C., 4,700,000
W. B. C., 15,600

April 19, 1894.

8 A.M. . . . . R. B. C., 4,850,000
W. B. C., 29,700

Seems sick.

11 A.M. . . . . R. B. C., 4,850,000
W. B. C., 39,000

1.30 P.M. . . . . R. B. C., 4,500,000
W. B. C., 28,100

5 P.M. . . . . R. B. C., 4,550,000
W. B. C., 46,800

8 P.M. . . . . R. B. C., 4,600,000
W. B. C., 31,200

April 20, 1894.

9 A.M. . . . . R. B. C., 4,425,000
W. B. C., 58,600

Appears to be better; eats freely.

2 P.M. . . . . R. B. C., 4,500,000
W. B. C., 23,600

8 P.M. . . . . R. B. C., 4,800,000
W. B. C., 20,300

April 21, 1894.

12 noon . . . . . R. B. C., 4,650,000
W. B. C., 15,600

5 P.M. . . . . R. B. C., 4,475,000
W. B. C., 9,370

Animal recovered.

Experiment XIV.—Same Rabbit as used in Experiment XIII (Immune to Diphtheriæ).

April 30, 1894.

9 A.M. . . . . R. B. C., 5,650,000
W. B. C., 12,500

9.30 A.M. . . . . R. B. C., 5,780,000
W. B. C., 17,100

Rectal temperature = 39.5° C.

11.30 A.M. Injected per jugular vein 3 cubic centimetres bouillon culture bacillus pyocyaneus, two weeks old.

1 P.M. . . . . R. B. C., 5,750,000
W. B. C., 31,200

Rectal temperature = 40.7° C.

5 P.M. . . . . R. B. C., 5,550,000
W. B. C., 19,000

Rectal temperature = 40.4° C.

8 P.M. . . . . R. B. C., 6,000,000
W. B. C., 26,500

Rectal temperature = 40.2° C.

11 P.M. . . . . R. B. C., 5,700,000
W. B. C., 96,000

Rectal temperature = 40.1° C.

12 midnight . . . . R. B. C., 5,650,000
W. B. C., 100,000

May 1, 1894.

9 A.M. . . . . R. B. C., 5,675,000
W. B. C., 67,100

Temperature = 39.9° C.

1 P.M. . . . . R. B. C., 6,050,000
W. B. C., 26,500

11 P.M. . . . . R. B. C., 5,775,000
W. B. C., 14,100

Temperature = 40.6° C.

Animal recovered.

From the foregoing experiments it will be seen that the leucocytosis of infection is due to the micro-organisms causing the disease, or to some product or constituent of the same. While the bacillus pyocyaneus may be diffused throughout the animal, the bacillus diphtheria remains at the local focus of infection, with rare exceptions.

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Animals inoculated with either micro-organism in such a way or of such virulence as to cause death, may show either a subnormal number of leucocytes up to death, or there may be periods in which leucocytosis is present, alternating with this condition.

A diminished number of leucocytes is the immediate result of all the inoculations.

When the animal resists the disease, a more pronounced leucocytosis is present than is found in those cases terminating fatally.

Immunization by repeated injections of heated cultures fails to cause any change in the number of leucocytes.

Subsequent inoculations in such animals show a much greater leucocytosis than animals resisting the infection without having been immunized.

When immunization had not been complete so that injection of bacillus pyocyaneus into the vein caused death, there was decidedly a greater leucocytosis than in ordinary fatal cases in animals not at all protected by immunizing materials,—evidence of a struggle between the infecting material and the resistance of the animal economy.

An animal immunized to bacillus pyocyaneus showed very slight change in his leucocytes when inoculated with diphtheria (except a diminution in number soon after the injection).

An animal immunized to diphtheria and afterwards injected with bacillus pyocyaneus showed a more pronounced leucocytosis than when inoculated with a virulent culture of bacillus diphtheriæ.

At first sight the facts that leucocytosis is present in fatal cases in man and is absent in fatal cases in rabbits may seem discordant. In the rabbit the poison was overwhelming, and death occurred very rapidly, while in man the cases were of longer duration, the resistance was greater, and hence we would expect leucocytosis. Perhaps it would have been better had guinea-pigs been used for the experiments with the bacillus diphtheriæ, but rabbits were selected because a greater number of blood examinations could be made from these animals.

The clinical and experimental facts are in harmony:—Mild infections with easy recovery show slight leucocytosis; severe cases terminating fatally either because the infecting agent is unusually severe or because the resistance is slight, show feeble leucocytosis; severe infections with a powerful resistance show the greatest leucocytosis.

The writer regrets his inability, on account of other duties, to make fractional counts in the case of immunity and infections, as it has been found that the former condition produces a great excess of the multinuclear forms (Everard, Dernoor, and Massart), and that the latter causes an increase of the eosinophiles (Kanthack and Hankin).

What does the leucocytosis of infections signify? It was claimed

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by Werigo that the diminished number of leucocytes immediately after the injection of bacteria was due to an accumulation in the internal organs of the leucocytes which had swallowed up the bacteria. This cannot be, for bacterial products alone or dead bacteria containing these poisons produce this same condition. Non-pathogenic bacteria, and, indeed, inorganic particles in the blood, will cause some slight leucocytosis; but this is entirely different from the leucocytosis caused by pathogenic substances.

Too much praise cannot be given to Metschnikoff, the founder of the school of phagocytosis, for his splendid work, nor, indeed, would any one question for a moment the fact of phagocytosis. But the great mystery of immunity cannot be explained by phagocytosis alone. The other school, holding that blood-serum is the only factor in the explanation of resistance and immunity, have gone to the other extreme. No one has explained satisfactorily the source of the immunizing and bactericidal substance of blood-serum.

The theory has been advancd that the resisting power of an animal arises from the spleen, but positive confirmatory evidence of this fact is still wanting.

An interaction between blood plasma—and indeed all the juices of the body—and the white blood-corpuscles is going on constantly. This has been clearly demonstrated in the formation of the fibrin factor. Cells are constantly being destroyed, liberating granules which, by their staining peculiarities, show difference of chemical composition, and great numbers of nuclei, all of which pass into solution in the fluid containing them. This is not simply the death of the cell because it is of no further use in the economy, the conditions which effect this destruction of cells, and the modifications seen in these cells in many of these conditions suggest that the increase in number and in the destruction of leucocytes has a definite purpose. The action is not phagocytic entirely, or we would not have this effect by such diseases as diphtheria which operate chiefly by the poisons produced and not by the bacteria themselves, and experimentally it has been found that bacterial products entirely free from the micro-organisms cause the same change. It must then be a *chemical* action, and it seems that, as the leucocytes suffer first and to the greatest extent when infection takes place, these cells are probably concerned in elaborating chemical antidotes to the toxic substance.

This is rendered the more probable by the experiments of Vaughan and McClintock,[1] which show that the germicidal action of blood-serum is probably due to nuclein in solution. While nuclein may be derived

[1] Medical News, December 23, 1893.

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from many sources, it seems that the great destruction of the leucocytes in infections must liberate a considerable quantity of it.

To recapitulate, the conclusions reached in this paper may be summarized as follows:

(1) That leucocytes originate in lymphoid structures, chiefly lymph-glands. They are all mononuclear at first, and as they grow may take on changes in shape and may show granules in their protoplasm, these alterations in the protoplasm being from some metabolic change.

(2) Extirpation of the spleen does not cause any particular form of leucocyte to disappear from the blood. There is a leucocytosis produced from the injury to the peritoneum.

(3) Digestion leucocytosis is present after a meal of proteids or hydrocarbons, but not after a meal of carbohydrates.

(4) The leucocytosis seen during the digestion of proteids is probably active in preventing auto-intoxication and not solely in dealing with normal products of digestion.

(5) The leucocytosis of pregnancy is by no means constant and bears no relation to the time of gestation or the number of the pregnancy.

(6) New-born children show a leucocytosis for a time.

(7) Massage and cold baths produce leucocytosis,—probably by hastening the circulation of fluids through the tissues and emptying the stagnant fluids of the tissues into the blood-stream.

(8) Cachectic states are often attended by leucocytosis. This may be due to some special intoxication or to septic infection or to involvement of serous membranes by secondary growth.

(9) The preagonal leucocytosis is due to some toxemia and not to the method of death.

(10) Post-hemorrhagic leucocytosis is much greater in man than in dogs. It is marked when transfusion is practised, but may be absent without transfusion. In man it is usually present because the tissues are more juicy than those of the dog.

(11) Inflammations of serous membranes cause leucocytosis, unless the disease be of tuberculous origin. Chemical irritants produce the same effect as bacteria.

(12) Sudden removal of fluid from the serous cavities causes a sudden diminution of the white blood-cells of the blood.

(13) Infections show leucocytosis, with the exception of measles, typhoid fever, and tuberculosis. The most pronounced leucocytosis is seen in pneumonia and diphtheria, the degree of leucocytosis depending on the virulence of the infecting agent and the resistance of the animal economy. The extent of the local lesion in the disease has no effect on the degree of leucocytosis.

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(14) There is a change in the kinds of leucocytes in typhoid fever and in scarlatina,—the large mononuclear forms being increased in the former and the eosinophiles in the latter.

(15) Substances positively chemotactic, other than bacterial poisons, cause leucocytosis when injected into the subcutaneous connective tissue.

(16) In infections, the fever, increased coagulability and altered alkalinity are insufficient to account for the leucocytosis. Thermic fever does not cause an increase in the number of leucocytes, but apparently they are being destroyed more rapidly. Peptone fever causes a diminished number, but no increase. Injections of nuclein and calcium chloride do not cause any distinct change in the number of leucocytes.

(17) The cause of the leucocytosis in infections is the action of some toxie substance, whatever it may be, and not the mere presence of bacteria either in the tissues or in the blood.

(18) Leucocytosis is slight:

(*a*) In cases terminating fatally either because there is a feeble resistance or because there is a very severe toxemia

(*b*) In mild cases recovering readily.

(19) Severe infections with strong resistance cause pronounced leucocytosis.

(20) Following the injection of bacteria into the blood there is a transient diminution in the number of leucocytes.

(21) Immunization does not cause leucocytosis.

(22) The greatest leucocytosis is seen in animals which have been inoculated after they have been immunized.

(23) The object of the leucocytosis in infections is probably to elaborate some chemical substances, which pass into solution in the juices of the body, and antagonize the action of the toxic substance causing the disease.

The Horace Wells Anniversary.

Attention is called to the notice in the Miscellaneous column of the celebration of the fiftieth anniversary of the discovery of the anesthetic properties of nitrous oxide by Dr. Horace Wells. Members of both the medical and dental professions are invited to unite in making the event a notable one, as it is a subject in which both are interested. Quite a rivalry has existed in regard to whom the honor of first directing attention to the anesthetic properties of nitrous oxide should be awarded. It is generally believed, however, that the introduction of nitrous oxide into dental practice was entirely due to the work of Dr. Wells, and it is hoped the coming celebration will be made in every way worthy of the importance of his discovery.

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MEMORANDA.

A CASE OF TYPHUS FEVER.

JULY 19. D. M., aged 23; single; sailor; born in Nova Scotia. Family history negative; previous history negative.

Present history: Left Boston some time in June on a cattle steamer bound for Liverpool. Stopped one week in Liverpool; and on July 7 started on return voyage in same steamer. The third day of the voyage he felt sick, aching all over. Blotches appeared on the abdomen and thighs like hives, and itched considerably. The fourth day out he was obliged to give up, and went to bed.

About July 12 had nose-bleed and diarrhea.

The steamer arrived in Boston July 17. The man was obliged by the captain to stand in line on deck with the other sailors while the health officer made his inspection. His condition was not noticed. His friends took him to his boarding-house in Cambridge, where he was treated for typhoid fever. On the 19th he was admitted to the Cambridge Hospital.

The next morning, July 20, the diagnosis was thought to be a possible case of typhus, and the patient was removed at once to the isolation building.

Physical Examination.—Face and eyes congested. Tongue clean at tip,—moderately coated with a thin yellow coating.

An eruption entirely over trunk, anteriorly, of a scattered papular character, of a rose-red color, and disappearing on pressure. Here and there are spots irregular in shape, blue in color, the size of a ten-cent piece. The same blue spots appear on legs and thighs. The upper part of thigh having a blue tinge. Below knee same tinge, but less distinct. These same spots are numerous over the back.

The whole skin has a dingy red hue. Coarse râles over chest posteriorly; a few anteriorly. Heart-sounds are normal. Pulse weak and compressible,—slightly reduplicated.

No gurgling or tenderness in right iliac fossa; slight tympany.

Has slight cough. Nose filled up; mouth-breathing.

July 20. Subsultus tendinum; carphologia; rash increasing; papular red spots spreading to hands.

July 21. Tongue fissured and red,—brown coating in centre. Movements from bowels like pea-soup. Has nose-bleed frequently.

July 24. Nervous symptoms very pronounced,—carphologia, and twitching of shoulders. Gets out of bed.

July 25. Nervous symptoms still worse. At times perfectly rational. Not deaf. He is unable to speak above a whisper. Face dark; fingers livid; spots less conspicuous.

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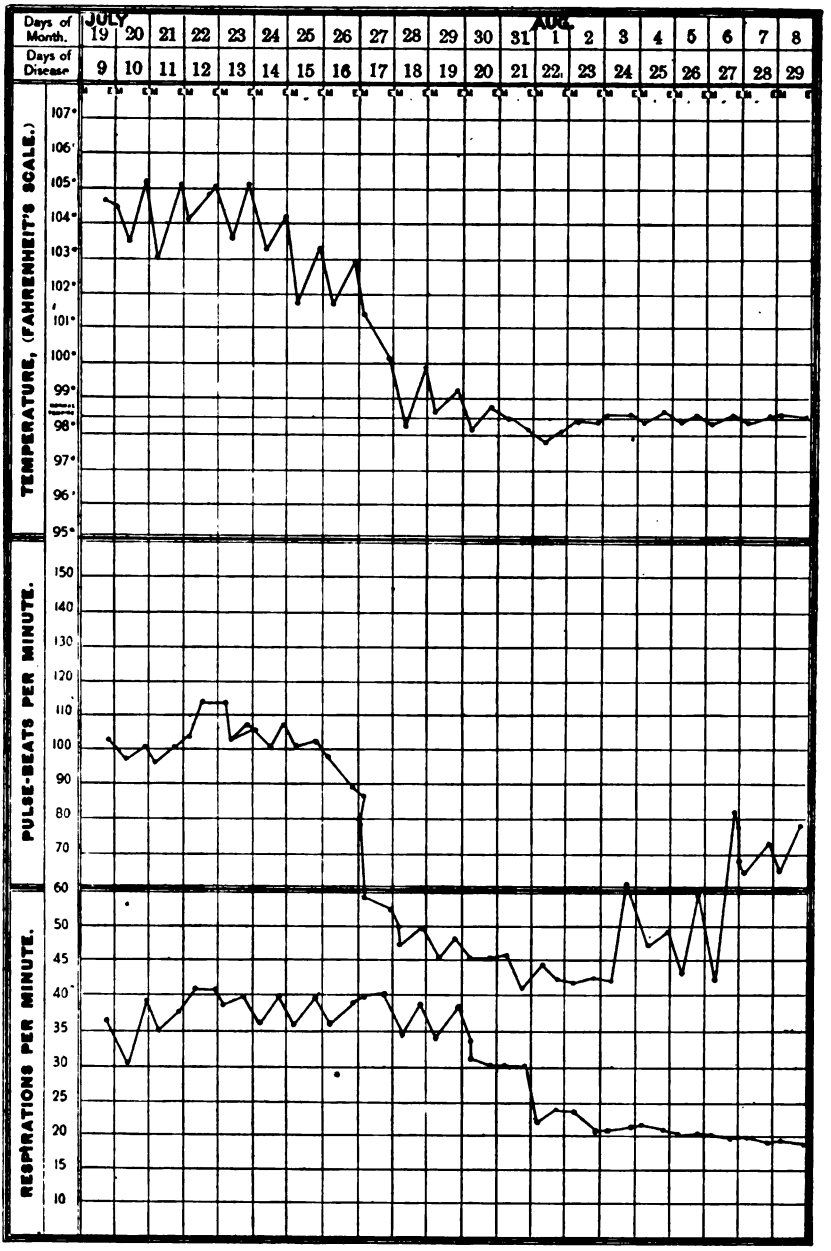
July 26. Mutters to himself. Reaches out his hand. Gets out of bed.



July 27. Tongue moist; mind clear. Asks for paper, etc. Strong odor always noticeable, and still present.

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August 2. About six o'clock each evening seems to become confused, and tells about imaginary objects.

August 14. Discharged well.

N. VAUGHAN SHANNON.

CAMBRIDGE, MASS.

DIAPHRAGMATIC HERNIA.

THE following case is interesting on account of the large extent of abdominal viscera in the thoracic cavity.

The patient was a man about 40 years old. His family history negative.

His previous personal history was as follows: A well man until ten years ago. At that time he fell from a tree, injuring himself so severely that he was confined to his bed for six weeks. The extent and location of injury could not be positively ascertained, but when he started to walk he complained of a sharp pain, deep in the left hypochondriac region. This pain continued more or less severe until the present attack. With the exception of this pain, he was apparently as well as before the injury ten years ago.

The present attack commenced while serving milk with haste in the morning. About 8 A.M. he suddenly felt the pain in the left hypochondriac region to a greater extent than usual. At 6 P.M. the pain spread to the umbilical region. At this time nausea and retching developed. At 8 P.M. he was given mustard and warm water by the family. This caused much retching and a bilious vomiting. The pain now became very severe all over the abdomen. He passed per rectum some hard fecal matter. At 11 P.M. there was great abdominal tympanites, dyspnea, and tenesmus. The skin was cold and clammy; pulse 90, and very weak; heart-sounds muffled. At 2.30 A.M., he was assisted to a commode, contrary to orders, and while there suddenly died.

At the post-mortem we found the following: Kidneys were flat and flabby, but in the normal position. Liver was dragged to the centre of the abdomen. Its borders were dark and congested.

The spleen was congested, pressed upward, and back. The esophageal opening in the diaphragm was ruptured, so as to admit a ball one and a half inches in diameter. Through this protruded the stomach and all the small intestines above a point eight inches above the ileocecal valve. Also that part of the large intestines included between the hepatic flexure and a point eight inches above the sigmoid flexure. The intestines were almost coal black, and were distended with gas.

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The heart and thoracic aorta were bloodless. The heart and lungs were pushed to the right side of the thoracic cavity. The heart was twisted, probably due to the pressure of the accumulated post-mortem gas. The lungs were entirely collapsed, and contained no blood.

WILMINGTON, DEL. SWITHIN CHANDLER, M.D.

SAND-BATH TREATMENT.

IN Bungo, Japan, near a town of a thousand homes, and 5000 inhabitants, on the coast of Kiushiu, at the foot of an old volcano, there is a warm-spring watering place much frequented by poor people. They crowd there between the barley harvest and the June rice planting. Eighty-two springs belong to the place. A peculiar way of taking this treatment is the sand-bath, and this is the manner of it: Some of the springs, all of them hot, are so near the beach that they are covered by the full tide. When the waters recede, basins are dug in the sand, heated by these, and frequenting patients bury themselves in these holes up to the neck. Some of these places are so hot that the inhabitants of the town cook vegetables and rice in them. The hotter the spring the purer the water. Those of lower temperature are sulphurous. Those who use the sand-baths usually remain for several hours in them, umbrellas being held over their heads to protect them against the sun. In cold weather, a number of boys spend there the whole day.

ALBERT S. ASHMEAD, M.D.

ALUMNI NOTES.

A NEW PRIZE FOR BEST SCHOLARSHIP.

The Society of the Alumni of the Medical Department of the University of Pennsylvania has decided to offer $50 as an accompaniment of the bronze medal given to the student receiving the highest general average at graduation. If the student wishes, a gold medal will be given in place of the customary bronze medal.

SURGEON F. B. Stephenson, U.S.A., having finished a cruise of three years on the Asiatic Station,—from Wladivatok and Japan to Singapore and Java,—is now on duty at the United States Recruiting Rendezvous, Boston.

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Dr. N. L. Johnson, of the class of 1891, has been appointed visiting physician to the City Hospital, Williamsport, Pa.

Dr. Horace G. Morton, class of 1880, has been appointed visiting physician to the Mercer Hospital, Trenton, N. J. Dr. William Elmer was at the same time made consulting physician. The other University graduates on the staff are Drs. I. M. Shepherd, F. H. Adams, H. G. Wetherill, N. B. Oliphant, and William Clark.

A Munificent Gift to the Students' Hall Fund.

At a meeting of the Trustees of the University of Pennsylvania, held on November 6, 1894, the gift of Mr. and Mrs. H. H. Houston, of $100,000 to the Students' Hall Fund, was announced. In recognition of the interest shown by Mr. and Mrs. Houston in the University, it was unanimously resolved that the hall should bear the name of their son, Howard Houston, who was a student at the University at the time of his death.

News of Dr. Donaldson Smith's Exploring Expedition.

The first news of the scientific expedition headed by Dr. Donaldson Smith, who graduated from the Medical Department of the University in 1889, has just been received. Dr. Smith started in June last to explore the unknown region lying 200 miles west of Berbera, Africa, and extending to Lake Rudolph, where traces of ancient civilization were believed to exist. Soon after his arrival at Berbera, he found a caravan of 110 camels, and, accompanied by two Englishmen, early in September reached a large stream believed to be the Erer. The expedition was greatly delayed after beginning its march, owing to defects in the transportation arrangements. The party explored the unknown country west of Milmil, and surveyed several rivers. During the progress of the work had a narrow escape from death by being charged by a rhinoceros. The country explored was full of interesting features. All the members of the party are in good health.

Necrology.

Charles P. Keichline, of the class of 1835, died October 28, in the 85th year of his age. Born in Bucks County in 1810, Dr. Keichline spent his youth there, but came to Philadelphia about 1830, and entered the University of Pennsylvania, from which institution he was graduated with honor as a doctor of medicine in August, 1835. He came of a long line of distinguished ancestors, and was a lineal descendant of John Peter Keichline, who immigrated from Heidelberg, Ger-

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many, and settled in what is now Bucks County as early as 1740. The three sons of the latter took a prominent part in the War of the Revolution, and by their courage, bravery, and loyalty to the cause left to their descendants a heritage of which they may justly be proud. After spending the first three years of his professinal career at Bellefonte, Pa., Dr. Keichline returned to Philadelphia, where he had been actively engaged in the pursuit of his profession until within a short time of his death.

Dr. Reid Alexander, a graduate of the Medical Department, University of Pennsylvania, class of 1885, died at his home of perforation of the bowel, October 8, 1894, aged 33 years, 11 months.

At the time of his death, Dr. Alexander was Assistant Chief Surgeon C. R. I. & P. Railway, Local Surgeon Missouri Pacific Railway, Medical Referee for the Mutual Life Insurance Co. of New York in the State of Kansas, Treasurer United States Pension Examining Board, Chairman Stormont Medical Library, and President of the Topeka Academy of Medicine and Surgery.

Dr. Alexander arrived in Topeka eighteen days after graduation, and commenced the practice of medicine at once, forming a partnership with Dr. D. W. Stormont, which existed until the latter's death, in 1887. His success was phenomenal from the start, and during the nine years of active professional life in this city he built up one of the finest and largest practices in the State, enjoying the honor and respect of both profession and laity.

He leaves a wife and three little girls to mourn the loss of a kind and loving husband and father.

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EDITORIAL.

THE ANTITOXIN TREATMENT OF DIPHTHERIA.

THE fate of tuberculin as a remedy for tuberculosis naturally makes one somewhat chary in accepting at the present stage of investigation the statement recently made by Duranton that, with the introduction of antidiphtheritic vaccine as a curative agent, "diphtheria has been vanquished, and croup has lost its terrors." It can be truly said, however, that the most favorable reports of the new treatment of diphtheria continue to be received from divers European sources. In a recent report, edited by the United States consul at Havre, the following statistics, furnished by the director of the Hôpital des Enfants Malades, of Paris, give the result of Dr. Roux's treatment. During the years 1890–1893 there were 3971 children treated in the diphtheria annex of the hospital, with the following death-rate for each year:

1890	55.80 per cent.
1891	52.45 "
1892	47.64 "
1893	48.47 "

This makes an average of 51.09 per cent. for the four years. When Dr. Roux and his co-workers entered the hospital (February 1, 1894) they at once began the new treatment of injecting the antitoxic serum, and of 448 children treated only 109 succumbed,—a death-rate of 24.33 per cent. As every other part of the treatment of the patients was the same as during the four years above cited, the difference between 51.09 and 24.33 per cent. is a fair representation of the advantages derived from the serum treatment.

In the *British Medical Journal* there have lately appeared reports of 39 cases of diphtheria treated by various observers with antitoxin, with an average mortality of 7.6 per cent.

Of 200 cases of diphtheria treated by antitoxin by Behring, Wassermann, Eslich, and Kossel, in Germany, 168 recovered, and 52 died, —a mortality of 30.95 per cent.

In Budapesth, the antitoxin treatment has yielded excellent results in the hands of Bokai. This authority states that in 35 cases of diphtheria in children under 12 years of age (the majority under 4 years), the mortality under the new treatment was only 14.33 per cent., the average mortality in the same hospital for the corresponding periods of the last three years was 53.8 per cent.

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Katz (*Berliner klinische Wochenschrift*, July 16, 1894) reports for Baginsky the result of the treatment of diphtheria in the Children's Hospital in Berlin with the antitoxin. In four years 1081 cases of diphtheria were treated, with a mortality of 38 9 per cent. In the three and a half months immediately preceding the beginning of treatment by antitoxin there was a mortality of 41.8 per cent. During the three months in which the antitoxin was used there were 128 cases so treated, with a mortality of 13.2 per cent. The exudation was not influenced in an unusual way, but in not a single case of the 128 treated was the larynx affected after the use of the remedy. Eighty-two healthy children were injected with a diluted solution of antitoxin for the purpose of vaccination. Eight of these became slightly ill, but none seriously. At the time of writing none of these children were sick with diphtheria.

In this country the first significant report of the value of the antitoxin treatment was made by Dr. Muehleck, in a communication to the Surgical Section of the College of Physicians of Philadelphia, held on November 9; the results of this observer have been summarized in the *Medical News* as follows: "The cases reported by Dr. Muehleck were five in number, occurring in the same family in children from 11 months to 6 years of age. All the injections were made in from twenty-four to thirty-six hours after the beginning of the attack. For immunization, one cubic centimetre, and for therapeutic purposes from one and a half to two cubic centimetres of *Aronson's* serum were used. Of the five children four were attacked. Two of these (one 11 months, one 6 years of age) were not treated with the antitoxin, owing to inability to obtain it, and these two, although treated by the hitherto generally-accepted rules of practice, died. One child that had mingled freely with the other cases, and in whose throat typical bacilli were found, was inoculated with the antitoxin as a prophylactic measure, and was not attacked by the disease. In all of the cases except one the bacteriologic tests proved the presence of the Klebs-Löffler bacillus. Of the two cases injected with the antitoxin both recovered; in one tracheotomy was indicated, owing to involvement of the larynx, but the stenosis was markedly ameliorated within twenty-four hours after the injection; in the other the mucous membrane of the tonsils, the soft palate, and the pharynx was involved, but without stenosis. After the injection there was a rapid fall of the temperature within twenty-four hours, the membrane became fatty and pultaceous, and came away in four or five days."

It will be seen, therefore, that the reports from all sources are sufficiently encouraging to warrant an extended trial of the new remedy. On account of the great variation in the severity of different types of

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diphtheria the true value of the antitoxin treatment can be determined only after a most exhaustive study. To Professor Behring belongs whatever credit is to be attached to this discovery. It was he who first demonstrated that successive inoculations of the horse with cultures of the Klebs-Löffler bacillus of increasing virulence finally rendered the animal immune, and that its blood-serum injected into other animals proved antidotal to the toxine of diphtheria. The Paris *Figaro*, of October 12, 1894, publishes the following method adopted by Dr. Roux in securing the antitoxin. The first injection under the animal's skin is an attenuated culture of diphtheritic bacilli. After the lapse of some days, this injection is renewed at fixed intervals, and is continued for six weeks; finally, the pure toxin is injected, and the horse is henceforth in readiness to furnish the serum on being bled. This operation can be performed every twenty days, after the lapse of which time the animal can supply, without injury or fatigue, 2.05 quarts of blood, which furnishes enough serum for the inoculation of forty children attacked with diphtheria.

The effective dose of antitoxin varies with the age of the patient, the severity of the type, and the stage of the disease in which the treatment is instituted. The amount usually employed varies from five to twenty-five cubic centimetres. Even in large amounts the serum seems incapable of producing deleterious effects. The injections are not followed by rise of temperature, abscess formation, or enlargement of the lymph-glands. In a few instances an urticarial or erythematous rash has been produced by the injections.

THE STATUS OF INTERCOLLEGIATE FOOT-BALL.

In the face of some adverse criticism—partly valid and just, but largely invalid and unjust—a greatly increased interest is manifested each year in the intercollegiate foot-ball contests. These games are looked forward to not only by the players themselves, but by the students generally, and even by the teachers. That the public shares this interest is attested by the very large numbers of spectators that invariably attend the important matches. Whether or not foot-ball is a proper exercise for college students to indulge in is still being debated, but it seems to us that the arguments are largely on the affirmative side. The two objections urged against foot-ball are, first, the liability of injury to the players, and, second, that it affords exercise to but a limited number of students. That accidents occasionally occur is not to be disputed, but that their frequency and severity are exaggerated by those who oppose foot-ball, in their over-zealous efforts to fortify their positions, is equally certain. The serious accidents that occur

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usually befall the "green" men. At the University of Pennsylvania there are between one hundred and one hundred and fifty men playing foot-ball, including the regular team, the substitutes, and the various class teams, and there has not been a single serious mishap this year, nor does the writer know of any grave accident having befallen the University team in past years. It is to be understood that foot ball is a science, and the men who are to play in hard games must be carefully trained for their work. It would be as reasonable to condemn navigation as too dangerous to follow if an inexperienced pilot had wrecked his vessel because he lacked the skill necessary for his position, as to condemn foot-ball because players are injured by entering contests for which they are not prepared.

Then, the extent of the injuries is constantly exaggerated. This statement has been made before, but it will bear repetition. Every one who has had any intimate connection with the men has repeatedly observed this, although it is not accepted by that small number who object to foot-ball on account of its "brutality," and who get all their information from the newspapers.

It has been said that foot-ball affords exercise to but a few students. The most ardent advocates of the game have hardly thought of making it a compulsory branch in the colleges as yet. There are other sports that may be taken up by those who have a taste for milder exercises, but, on the other hand, we see no reason why those who prefer foot-ball may not be allowed to follow their inclination. The actual players are *not* the only ones benefited, however; those who attend the games undoubtedly share this influence.

The advantages of foot-ball over other forms of athletic sports has been dwelt upon at great length by various writers. Colonel O. N. Ernst, Superintendent of the West Point Military Academy, in his recent annual report, discusses at considerable length the advantages and disadvantages of foot-ball. His conclusions are that foot-ball as controlled there has been a benefit to scholarship and an aid to discipline, and should receive a proper degree of encouragement. He states that any innocent amusement which during the hours set aside for recreation will take the mind of the cadet absolutely away from his books will benefit him. Foot-ball accomplishes this object more completely than any other game. Its effects in this respect are not confined to the actual players, but extend to practically the entire corps of cadets.

The enforcement of a well-regulated life such as is lived up to while in training, the concentration which is necessary, the strict discipline, the increased courage, and the ability to exert one's entire force to the accomplishment of an object must be of the greatest service as a part of an educational scheme.

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Our Alumni will be particularly interested in hearing of the excellent work which is being done by the University team this season. It is only within a few years that an interest has been manifested in the game at the Pennsylvania. During this time, however, the improvement has been most marked. The present season has been one of uninterrupted victories, and only once has the opposing team been allowed to score. The game with Princeton, which resulted in a score of 12 to 0, in favor of Pennsylvania, was, it is said, the finest exhibition of foot-ball ever witnessed. The game with the Cornell team, more recently, was equally brilliant, for although they played the best game in their history, they were not able to score, although they made twelve points in the game with Harvard and six in that with Princeton. The University team is scheduled to play but one more game this season, which is with Harvard at the University grounds on Thanksgiving Day, November 29. This event is being looked forward to with keen interest, and if the weather is fair it is predicted that 25,000 people will be present.

Too much praise cannot be bestowed upon coach Woodruff and upon the team individually for their excellent record. The enthusiasm over the game reaches its height in the medical department, which furnishes not only the staunchest undergraduate admirers and the most loyal and earnest supporters among the Alumni, but also some of the very best players, including in this team, as it did in the winning team of 1892, the captain.

The Relative Standing of the Graduates of the Various Medical Colleges.

The following table indicates the relative standing of the graduates of the various medical colleges in the examination held by the State Board of Medical Examiners, June 11–14, 1894.

Medical College from which Applicants Graduated.	No. Examined.	No. Failed.	Per Ct. of Failures.	Average Grade.
University of Pennsylvania	76	1	1.32	87.76
Woman's Medical College	18	2	11.11	83.44
Jefferson Medical College	67	5	7.46	83.29
Medico-Chirurgical College	26	3	11.54	82.48
Western Pennsylvania College	44	3	6.82	81.13
College of Physicians and Surgeons (Balt.)	3	1	33.33	80.68
Baltimore Medical College	8	5	62.50	75.81
Miscellaneous Colleges	26	9	34.61	74.77
Total	268	29	10.82	82.18

Medical News.

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MEDICAL PROGRESS.

MEDICINE.

UNDER THE CHARGE OF

WILLIAM PEPPER, M.D., LL.D., AND JAMES TYSON, M.D.,

ASSISTED BY

M. HOWARD FUSSELL, M.D.

Digestibility of Sterilized Milk.

Bendix (*Jahrbuch für Kinderheilkunde*, Vol. xxxviii, Part iv) has made researches upon sound and sick children as to the digestibility of both sterilized and non-sterilized milk. He concludes:

(1) That in healthy children there is no difference as to the digestibility of the two milks.

(2) In sick children the sterilized is digested just as well as the unsterilized, notwithstanding the fact that the absorption of fat and nitrogen is so much reduced in such children.

(3) The taste and smell of milk, while they may be changed by sterilization, are not materially so, and sterilized milk is readily taken by children.

(4) He has never seen the health of children badly affected by the use of sterilized milk. On the other hand, they eat well, grow, and their stools are normal, and they never have vomiting.

(5) The transmission of severe diseases from animals to men is prevented by the sterilization of milk.

(6) Sterilization is much preferable to Pasteurization, and heating the milk to 212° F., while it does not hinder its digestion, absolutely kills all bacteria and spores.

Quinine in Cholera.

Fullerton (*New York Medical Journal*, August 18, 1894) gives a table of statistics, in which he claims to show that cases of cholera treated with quinine have a much lower death-rate than when treated in any other way. This he attributes to the high inhibitory power of quinine, and believes that the very fact that medicines are not absorbed from the intestinal tract favors the curative action of the quinine by allowing it to inhibit the cholera spirillum in the intestinal tract. It must be given in comparatively large doses. In ordinary cases ten grains must be given every hour until twenty to forty grains are given; afterwards *pro re nata*. In collapse the same dose should be given half-hourly. Besides the administration of quinine, hypodermoclyses, appliances for supplying heat, and morphine hypodermics to relieve pain should be used where necessary.

Enteroclyses of quinine should be used where the quinine is vomited. He believes that the early administration of quinine will reduce the mortality to 4 or 5 per cent.

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Tannigen, a New Intestinal Astringent.

Meyer (*Deutsche medicinische Wochenschrift*, No. 31, 1894), in this article calls attention to the inefficiency of most astringents upon the lower bowel because of their destruction in the stomach or upper bowel, the large dose in which they must consequently be exhibited, and the deleterious effect of this large dose upon the stomach itself. The new compound is a pentacetate of tannin. It occurs in yellowish-gray powder, is tasteless and odorless, and is slightly hygroscopic. It can be heated to 330° F. without change. It is insoluble in cold water, and only slightly soluble in hot water. The action of this drug was first tried on cats. It was found that relatively large doses could be taken without interfering with the stomach in any way, and that it had a decidedly constipating effect.

Müller (*Ibid.*) has tested "tannigen" on some of his patients, with the following results: The patients take the powder without any ill effects either upon the appetite or the stomach. The drug was so harmless that a definite dose was not ordered, but a knife-pointful was directed three to eight times daily. It was used in chronic diarrhea, chronic intestinal catarrh, and in some cases of recurring dysentery, and in cases of intestinal disturbance in phthisical patients. In most cases the number of stools was decreased on the day after the drug was begun. In some, as in phthisical cases, the good results lasted only so long as the drug was continued. But as soon as the drug was again commenced the diarrhea stopped. Some of the patients took the drug for several weeks without ill effects or lessening of the good effects. The drug was also tried in a small epidemic of acute diarrhea, and the disease in all the cases was brought quickly to an end. In the acute and subacute diarrheas of children the drug is valueless except the diet be changed. It is also without good effect in the atrophic cases of nursing infants. He concludes that it is of most value in chronic diarrhea, and is actually curative in these cases. He thinks that it is also of great value in the diarrhea of phthisical patients, where it can be given for a long while and will not interfere with the appetite or digestion.

Dental Manifestations of Gout.

Kirk (*Lancet*, June 30, 1894). The co-existence of certain forms of suppurative gingivitis and gouty diathesis has long been known. Dr. Peirce, of Philadelphia, has shown that the calcareous deposits taken from the roots of teeth lost from pyorrhea alveolaris contain, besides the usual calcium carbonate, considerable uric acid and urates of calcium and sodium. He concludes that the deposits upon the roots of such teeth are not salivary, but hemic in origin, and that pyorrhea alveolaris is simply a local manifestation of gout. As further evidence of the correctness of these conclusions, the author has found that, after thorough local treatment, the gingivitis will disappear, and have no tendency to return. He has found a marked acidity of the secretions of the mucous glands of the mouth in such cases, which brings about local decalcification of the enamel. He first used cream of tartar to correct this acidity. He afterwards had a lithium tartrate prepared, which gave much more satisfactory results than any other alkali used. The promptness with which it acts is sometimes astonishing. After three doses of five grains each all symptoms sometimes subside.

Typhoid Fever.

A report on typhoid fever in the District of Columbia, made to the United States House of Representatives by the Medical Society of the District of Columbia,

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contains several instructive maps as to the causation of typhoid fever in cities. Some important conclusions are formulated, among which are the following:

(1) Typhoid fever increases in proportion to the saturation of the soil with decomposing organic matter, especially human excreta, and to the drinking of infected well-water.

(2) Typhoid fever decreases in proportion as a city is well sewered, and in proportion to the abandonment of the drinking of well-water, and of all contaminated water.

Some Statistics of Diabetes Mellitus.

Davis (reprint of a paper read before the Illinois State Medical Society, May 15–17, 1894) has observed that there is a reasonable variation in the occurrence and severity of cases of diabetes mellitus. The observations were made upon fifty-five cases. He has observed that glycosuria has occurred three times as often in March and April as in January. Four times as often in July and three times as often in November. It occurs least frequently in December, January, and February. It is notably less common in May than in April and July. It gradually diminishes through August, September, and October to rise abruptly in November. Further study of the records shows that in mild cases variations in the amount of sugar in the urine in the same month are great, though the same diet and the same treatment be persisted in. It was also noticed that there was no relation between the specific gravity of the urine and the percentage of sugar it contains. The feelings of weakness and malaise so characteristic of the diabetic state are correlated with the amount of sugar eliminated, but very different amounts will produce the same results in different individuals.

The Production of Diseases by Sewer Air.

Jacobi (*New York Medical Journal*, August 4, 1894) concludes his article upon the above subject with the following sentences:

(1) The atmosphere contains some specific disease-germs, both living and dead.

(2) They are frequently found in places which were infected by specific diseases.

(3) In sewer air fewer such germs have been found than in the air of houses and school-rooms.

(4) Moist surfaces,—that is, the contents of cesspools and sewers, and the walls of sewers,—while emitting odors, do not give off specific germs, even in a moderate current of wind.

(5) Splashing of the sewer contents may separate some germs, and then the air of the sewer may become temporarily infected, but the germ will soon sink to the ground again.

(6) Choking of the sewer, introduction of hot factory refuse, leaky house-drains, and absence of traps may be the cause of sewer air ascending or forced back into the houses. But the occurrence of this complication of circumstances is certain to be rare.

(7) Whatever rises from the sewer under these circumstances is offensive and irritating. A number of ailments, inclusive, perhaps, of sore throats, may originate from these causes. But no specific diseases will be generated by them except in the rarest of conditions. For specific germs are destroyed by the processes of putrefaction in the sewers, and the worse the odor the less is the danger, particularly from diphtheria.

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(8) The causes of the latter disease are very numerous, and the search for the origin of an individual case is often unsuccessful.

(9) Irritation of the throat and naso-pharynx is a frequent source of local catarrh; this creates a resting-place for diphtheria-germs, which are ubiquitous during an epidemic, and thus an opportunity for diphtheria is furnished.

(10) Of the specific germs, those of typhoid and dysentery appear to be the least subject to destruction by cesspools and sewers. These diseases appear to be sometimes referable to direct exhalation from privies and cesspools. Very few cases, if any, are attributable to sewer air.

(11) A single outlet from a sewer would be dangerous to general health, because of the density of odors (not germs) arising therefrom. Therefore a very thorough and multiple ventilation is required.

Treatment of Prurigo in Children.

The *Jarhbuch für Kinderheilkunde*, Vol. XXXVIII, Part IV, quotes the following: Iwanow (*Westnik Obschtschetswennoj*, July, 1892) recommends the following treatment for prurigo: For the increase of nourishment of the skin he uses an especially fat diet. He adds a tablespoonful of lard to a glass of milk, and for older children gives cod-liver oil. For the itching he uses a 3- to 5-per-cent. solution of carbolic acid, or a 5- to 10-per-cent. solution of glacial acetic acid in water or glycerin. The watery solution is used only in severe cases, frequent baths being harmful, but baths once or twice a week lasting ten or fifteen minutes and followed by the use of the glycerin solution readily effect a cure.

After the itching disappears inunctions of glycerin are used twice a day for two months.

Spinal Thrombosis and Hemorrhage.

Williamson (*Lancet*, July 7, 1894) reports the following case: A man, aged 28, was admitted to the infirmary September 22, 1893. One month previously he began to suffer with pains in the back and under the left scapula. The pain was not severe. He noticed difficulty in passing urine September 20. In the evening his gait was unsteady. On awaking in the morning he found both legs entirely paralyzed.

There was no pain and no girdle sensation. After the 20th there was loss of control over the rectum and retention of urine. Five days afterwards he had complete loss of all the reflexes of the thigh and legs. There was loss of sensation in the legs and on the trunk as high as the sixth intercostal space. After admission rigors occurred. There was a history of syphilis two years previously. On examination, post-mortem, brain congested. The spinal cord showed no signs of softening. The meninges were congested, but there were no other naked-eye evidences of disease of the cord. On section a hemorrhage was found about the middle of the dorsal region. The vertical length of this hemorrhage was about one and three-fourths inches; it was situated in the gray matter. It extended across the gray commissure into the gray matter on the right side, the greater hemorrhage being on the left side. There were a few white points seen in the white matter on both sides. In the upper dorsal and cervical regions there were signs of ascending degeneration. The vessels were enormously dilated, they were packed full of red corpuscles, and very many were thrombosed, and there was extensive endarteritis. The vessels of the meninges also showed distinct syphilitic changes.

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Taborde's Method for Asphyxia in the New-Born.

This author (*Gazette Médicale de Paris*, January 14, 1893) treats this condition by seizing the tongue of the child with forceps and making rhythmical traction upon it, alternating this by allowing the tongue to fall back. By this method natural breathing is established in ten minutes. One case is quoted where, in spite of the use of ordinary methods for one hour and a half, breathing was not established. In the last moment Taborde's method was used, and in a short time the child breathed naturally.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

ASSISTED BY

G. G. DAVIS, M.D., M.R.C.S., AND ELLWOOD R. KIRBY, M.D.

Notes upon the Pathology of Tendon Contractures.

Doyon (*Province Medical*, No. 14, 1894) says that in previous experiments as to the mechanism of the contractures of tetanus, the cause was claimed by authors to be a reflex one, and whether the reflex curve involves the sensory or the motor tracts is yet to be proven.

With this object in view, the author carried out a series of experiments upon dogs, and first studied the contractures in the immediate neighborhood of the point of infection.

The reaction produced by the irritation of a mixed nerve in relation to the arterial pressure was the same on both sides. As a result of the experiments, the author says, in conclusion, that the ptomaine of tetanus acts only on the sensory nerves. These experiments also explain the fact why even the slightest peripheral irritation produces such widespread contractures.

The Use of Antipyrin in Cystitis.

Vigneron (*Ann. des Malad. des Org. Genito-Urin.*, 1893) has found that in many cases of cystitis no local treatment can be carried out on account of the intense pain produced by such manipulations.

The author is now in the habit of injecting a solution of antipyrin into the bladder and then continuing with the local treatment. The effects of the antipyrin are similar to cocaine, but has the advantage that it may be used for a long time without any constitutional effect.

If the bladder be not dilated, ten to twenty grammes of a 4-per-cent. solution of antipyrin should be injected into the bladder at least ten minutes before the local treatment is carried out.

In dilated bladders the local treatment may be carried out first, and then from sixty to one hundred and twenty grammes of a ½- or 1-per-cent. solution of the drug may be injected into the bladder and allowed to remain.

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The Function of the Stomach after Resection of the Pylorus.

Imredy (*Wiener medicinische Presse*, No. 13, 1894) has made a series of experiments as to the function of the stomach after pylorus resection, with the following results:

Dilated stomachs after the removal of the stricture usually recover their normal function.

The normal contractions of the organ likewise return to normal.

Contributions to the Study of Appendicitis.

Jacob (*Thèse de Paris*, 1893) examined eighty cadavers and found no traces of appendicitis, and that the usual position of the appendix is to the outside of the cecum and in a horizontal position.

In all the cases of appendicitis in which the location of the appendix was diagnosed it was found to be behind the cecum or extending down into the pelvis. This position the author thinks rather predisposes to inflammation of these parts because of the necessary stagnation of feces.

The Inoculability of Cancer.

Geissler (*Centralblatt für Chirurgie*, No. 27, 1894) says that Adamkiewicz claims the cancer cells to be living organisms and similar in character to parasites.

Geissler repeated the experiments of Adamkiewicz upon twenty-five rabbits, and found that if pieces of aseptic cancer-tissue were placed in the brains of these animals, no reaction resulted, and all the pieces were absorbed like any other animal tissue. Only in those cases in which septic material was introduced did the results correspond to those of Adamkiewicz.

Painful Peritoneal Adhesions.

Nicaise (*Revue de Chirurgie*, 1894) states that the use of antiseptic methods and the consequent development of antiseptic surgery have made surgeons better acquainted with peritoneal adhesions, and have led to their successful treatment by operation. These adhesions may give trouble by disturbing the function of implicated organs, and by exciting pain. The pain varies in character and intensity in different cases. It may be caused by displacement of organs to which the adhesive bands are attached, or by constriction of the intestinal canal. The pains in the latter condition are often very severe, and of a similar nature to that of hepatic and renal colic.

The diagnosis of peritoneal adhesions is often very difficult. In some cases their existence can only be assumed by the process of exclusion, while in others their certainty can only be demonstrated by an exploratory operation. The author is of the opinion, however, that a diagnosis can be made in many cases by close inquiry concerning such details as previously occurring abdominal inflammation, the seat of pain, and the relation to the seat of any previous inflammation, the time when the pain comes on in regard to the taking of food.

As many peritoneal adhesions become longer and thinner and have a tendency to disappear, there should be no great hurry in having recourse to an operative procedure. When, however, they cause great pain, a laparotomy should be performed and the adhesions broken up. The cure that will thus be effected will be permanent and complete.

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The Cause and Relief of Post-Operative Neuralgia, especially in Amputation Stumps.

Witzel (*Centralblatt für Chirurgie*, No. 29, 1894) claims that the cause o the neuralgia in stumps after amputation is not the result of growth in the nerve but from the fact that the nerve is caught in the scar.

Socin claims that he never has stump neuralgia after amputation, and, as he says, it is due to the fact that before the wound is closed strong traction is made on the nerve so as it can be cut off as high up as possible.

For the relief of such a condition when once developed, Witzel recommends resection of the nerves.

Plastic Surgery of the Scalp.

Messner (*Centralblatt für Chirurgie*, No. 32, 1894) says that in many operations about the head it is often necessary to remove considerable portions of the scalp, leaving large defects which often remain open granulating wounds for years.

Volkmann's method consisted in a dividing up of the large defects into a number of small granulating areas by the following method:

In the ordinary round defect four tongue-like flaps are dissected up around the margin of the defect, and then all turned on their axes towards the middle point of the defect, and the ends of the flaps sutured together.

Gangrene of the flaps is seldom to be expected on account of the size of the base of the flaps.

The author reports two cases in which large defects were completely closed.

Bone-Disease in Typhoid Fever.

Klemm (*Archiv für klinische Chirurgie*, Bd. xlvi) says the most frequent bone complication in typhoid fever is limited generally to the cortical layer.

This inflammation may end in resolution, caseation, or liquefaction.

This form of bone inflammation is generally accompanied with suppuration of the medulla, and is due to the mixed infection with two species of micro-organisms.

An examination of the exudate showed the bacillus of Eberth and the typhoid bacillus. In those cases in which suppuration resulted the staphylococcus and the streptococcus were found. Occasionally in certain cases no pus organisms were found in the exudate, even though suppuration had taken place. The author claims this to be the result of the persistence of the typhoid bacillus.

Experiments were carried out upon rabbits, a pure culture of typhoid organisms being injected in the veins of the ear. In five of the ten animals experimented upon a positive result was obtained in from ten hours to twelve days, the organisms being found in the medulla of the femur.

In several animals the typhoid infection was followed by an injection of a pure culture of the staphylococcus. As a result of this double infection, those animals that lived developed an acute osteomyelitis with separation of the epiphyses.

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THERAPEUTICS.

UNDER THE CHARGE OF

HORATIO C. WOOD, M.D., LL.D., AND ARTHUR A. STEVENS, M.D.

Erysipelas Streptococcus in Anthrax.

Emmerich (*Münchener medicinische Wochenschrift*, July 10, 1894), having previously demonstrated that anthrax bacilli in the tissue gave evidence of disintegration in the presence of erysipelas streptococcus, the bacillus of Friedländer, and the bacillus pyocyaneus, gives a further account of his experiments in this field, in connection with Most, Scholl, and Isuboi. He first cites a case in which a rabbit suffering with severe anthrax was cured by the injection of a virulent culture of erysipelas streptococcus. A pure culture of streptococcus, obtained from a case of facial erysipelas, was injected into rabbits, and the blood-serum freed by filtration from the erysipelas streptococcus was used in the treatment of anthrax. Three rabbits were injected with this serum, one, four, and eleven and a half hours respectively after being inoculated with anthrax. Two recovered completely, and the third (pregnant) lived twenty-four hours longer than the control animal. This serum treatment must be continued during five days. The serum of sheep's blood prepared in a similar way is even still more efficient. Two experiments are reported in which rabbits infected with anthrax were so treated with complete success, the control animals dying rapidly. The author concludes with the hope that the same treatment may be successfully applied in cases of anthrax in man.

Cannabis Indica.

Mackenzie (*Semaine Médical*, No. 14, 1894) speaks highly of cannabis indica in all forms of cephalalgia. He has found it act favorably even in the severe headache attending cerebral growths. In chronic uremia, where opium is contraindicated, it is especially serviceable. He has found the remedy to be almost a specific for that continuous form of headache which begins in the morning and lasts all day. In these cases the pain is generally dull and diffuse, but marked by occasional exacerbations. While it is rarely severe enough to interfere with occupation, yet it constitutes a source of constant annoyance to the patient. In such case the author administers morning and evening from one-twelfth to one-half grain of the extract in pills. If these doses are not sufficient, he gives one grain in the evening and one-half grain in the morning. In very obstinate cases the dose is still further increased, the larger dose always being taken in the evening, until relief is afforded or toxic symptoms become manifest. In some instances Mackenzie combines gentian, cinchona, or hydrobromate of caffeine with the cannabis indica. In various neuralgic affections, gastralgia, enteralgia, the pains of tabes the drug often proves very useful.

In skin-diseases associated with intense itching, particularly senile pruritus, where local applications fail to relieve, cannabis indica is often used with great benefit. The author has rarely observed any untoward effects from its use, nevertheless, to avoid toxic manifestations, the drug should be given at first in small doses, the latter being gradually increased.

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Chlorinated Lime in Pruritus Ani.

Berger (*Zemski Vratch*, No. 13, 1893) speaks highly of the treatment of pruritus ani by inserting into the orifice (for about one inch) a piece of cotton wool soaked in liquor calcis chlorinatæ. When slight turning or smarting is felt, the plug should be extracted, and the anal region washed out with the same lotion, after which the parts should be left to dry spontaneously. The itching is said to vanish instantaneously, while after a few applications of the remedy any accompanying symptoms (such as swelling, eczema, etc.) also disappear.

Treatment of Atonic Gastric Dilatation.

Wegele (*Münchener medicinische Wochenschrift*, March 28, 1894, and *British Medical Journal*) deals with the severer forms of this disease, and not with such as accompany any gastric affection lasting over any considerable time. For the practical distinction of mild from severe cases, the test breakfast is useful; in marked cases remains of food are found in the water used for washing out the stomach on the following morning, whereas in mild cases the stomach is able to deal with such moderate demands. Pronounced atonic dilatation is not, in the author's opinion, such a rare event as is sometimes represented. At first the dry diet was employed, and for slighter cases it sufficed; but a rigorous carrying out of this regimen was often of disadvantage. Washing out the stomach proved a great advance, as in this way the stomach was freed of every acid and fermenting contents. Here, however, a considerable amount of nourishment is withdrawn, and the patient's nutrition and weight may suffer. Rectal alimentation must in addition be had recourse to; either water alone or the desirable food stuffs may be thus used. The amount of urine passed is a practical measure of the gastric insufficiency. By a strict dry diet and supplying the necessary water by the rectum, the patient's condition may be very greatly improved. Clysters containing grape sugar are apt to ferment and to produce diarrhea, and the same is true of those containing peptone frequently repeated. The diet must be suited to the condition of the gastric chemistry. If hyperacidity is present, large doses of alkalies are indicated. Washing out the stomach is, according to the author, best done in the morning. Raising the foot of the bed is said to be useful in helping to empty the pyloric antrum. If fermentation is present, harmless antiseptics should be added to the water, and salicylic acid, creosote, bismuth salicylate given internally. If the abdominal walls are lax, a belt should be used. The author says that the prognosis is considerably improved by the use of the dry diet, and supplying fluid by the rectum.

Bone-Marrow in the Treatment of Pernicious Anemia.

Fraser (*British Medical Journal*, No. 1744, 1894) reports a case of pernicious anemia in which he employed bone-marrow with considerable success. The patient was a man, aged 60 years, suffering from dyspnea, swelling of the feet, frequent spells of vomiting, diarrhea, great weakness, and slight pyrexia. Examination of the blood revealed: hemocytes, 1,860,000 to 1,460,000 per cubic millimetre; hemoglobin, 28 to 30 per cent. Three ounces of uncooked bone-marrow from the ox were given by the mouth daily. After twenty-seven days the hemocytes numbered 3,900,000 per cubic millimetre, and the hemoglobin amounted to 78 per cent.

Danforth (*Chicago Clinical Review*, Vol. IV, No. 1, 1894) reports a very

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severe case of pernicious anemia in which good results attended the use of bone-marrow. The anterior extremities of calves' ribs were comminuted so as to expose the cancellated tissue, and the fragments were placed in a jar and covered with glycerin, to the influence of which they were exposed for three or four days, being occasionally agitated. At the end of this time the liquid was strained through flannel, and the resulting fluid presented a reddish, syrupy appearance, without pronounced odor, and with the taste of glycerin. At first a teaspoonful of this extract was administered thrice daily, together with five drops of Fowler's solution, but as the sweetish taste of the preparation excited nausea, the following combination was substituted:

Solution of potassium arsenite	2½ drachms.
Acid sodium phosphate	3 ounces.
Extract of bone-marrow	8 ounces.

A dessertspoonful of this mixture after each meal proved entirely satisfactory. The patient steadily gained in strength and spirits, and in a short time presented every indication of restoration to former health. The hemoglobin rose from 35 to 80 per cent., and red blood-corpuscles increased proportionately.

GYNECOLOGY.

UNDER THE CHARGE OF

WILLIAM GOODELL, M.D., AND CHARLES BINGHAM PENROSE, M.D.,

ASSISTED BY

WILLIAM A. CAREY, M.D., AND H. D. BEYEA, M.D.

SALPINGITIS NODOSA.

WERTHEIM (*Centralblatt für Gynäkologie*, No. 18, 1894), at a recent meeting of the Obstetrical and Gynecological Society in Vienna, reports a case and describes salpingitis nodosa. This form of salpingitis was first described by Schauta and Chiari. It is characterized by the presence of nodes in the tube-wall, which vary in size from a pea to a hazel-nut. They are always found in relation with the proximal third of the tube, and are associated with inflammation at the ampulla and other portions of the genital tract. These nodes were formerly believed to be fibromyoma, but Chiari, through careful microscopic examination, found that the form of growth was not constant, but that the greater number were due to inflammatory hyperplasia of the muscular wall of the tube. The columnæ epithelium of the tube mucous membrane is usually "in tact." Frequently, as the disease advances, the tube lumen becomes narrowed at short intervals, and, finally, numerous small cysts are produced,—follicular salpingitis. Wertheim's case differs from those described by Schauta and Chiari, in that the nodes, which were the size of small walnuts, on section were found to be small abscesses containing thick yellow pus. On the right side each abscess communicated with the uterine cavity by means of a minute canal. The tube canal on both sides was filled with pus, and the ostium closed. Schauta, in his discussion of the report of this case, concluded that it represents an advanced form of salpingitis nodosa.

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Tachycardia following Laparotomy.

Negri (*Annali di Ost. e Gin.*, 1893, No. 6) calls attention to a condition of tachycardia following laparotomy. He has observed two cases where, unassociated with fever, the pulse became very much accelerated following perfectly aseptic laparotomy. The rapid pulse continued for many days, the patient in both instances slowly recovering. Negri's cases differ from those reported by Mangiagalli, in that the attack was not abrupt or paroxysmal, and both patients finally recovered. He believes the condition to be wholly a nervous phenomenon.

The Sterilization of Catgut.

Kronig (*Centralblatt für Gynäkologie*, No. 27, 1893) discussed the methods of sterilization of catgut by disinfection or heat, and advises a new method of sterilization by means of boiling in cumol. A hydrocarbon compound which has a boiling-point of 168° to 178° C. He believes, as shown by the experiments of Geppert, that the disinfection of catgut with watery and alcoholic solutions of the bichloride of mercury does not kill the germs, but simply inhibits their growth. As long as the catgut retains the bichloride no organisms will grow, but if it be treated with a solution of the sulphide of ammonium destroying the bichloride organisms will soon appear. The method of Reverdin, the application of dry heat at a temperature of 140° C. for four hours, he believes is positive, but that the method requires too much time and apparatus. The application of dry heat at a temperature of 130° C. for one hour, as advised by Döderlein, does not render the catgut sterile. The method of Brunner, boiling it in xylol at a temperature of 136° to 140° C. is ordinarily positive, but the writer has observed that certain spores which much resemble anthrax are not destroyed by this method, even though the boiling be continued for several hours. Kronig advises the following method: Each strand is made into a ring four fingers' breadth in diameter and held loosely in place by three or four turns of thread. The object of this being to allow contraction of the catgut during sterilization, and also, when wound upon rollers, it is usually very difficult to remove. After being thus prepared it is placed in a dry sterilizer at a temperature of 70° C. for one hour so as to drive off the hydroscopic water, then direct into a beaker containing cumol which is two-thirds buried in a sand bath. The vessel containing the sand should be seventeen centimetres (six and a half inches) in diameter and fourteen centimetres (five and a half inches) deep. Heat is then applied with two Bunsen burners, or a round burner. And wire gauze is placed over the beaker to prevent the cumol from catching fire. When the cumol has reached a temperature of 155° C. the flame is removed, as ordinarily the temperature continues between 155° and 165° C. for an hour. A thermometer is not necessary, the boiling-point of the cumol being the guide. After thus heating for one hour the catgut is removed with sterilized forceps and placed in a previously sterilized beaker containing petroleum benzine (G. P.). In this petroleum benzine it may be kept until used, or after three hours it may be removed and placed in sterilized Patri cups. The catgut kept in Patri cups remains sterile for many weeks. Where a dry sterilizer is not at hand the catgut may be placed in a beaker or the sand bath, for two hours the temperature in the beaker would be between 70° and 100° C. A temperature of more than 100° C. dry heat destroys the catgut. Catgut previously infected with spore-forming bacilli and sterilized after this method was found to be sterile. The infecting spore-forming bacilli were shown to be particularly resisting in that, after being subjected to two hours' steam, sterilization gave many colonies on agar-agar plates. Cumol, as prepared by Dr. Grübler, of Leipzig, is a fatty, light-yellow, non-explosive liquid.

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Early Diagnosis of Cancer of the Cervix Uteri.

Dr. Ernest Herman (*British Medical Journal*) says that as secondary growths occur later and less frequently in the uterus than in any other part of the body, the early recognition and removal of the diseased area is of the utmost importance. The readiness with which the vaginal portion of the cervix may be examined makes it possible to detect diseases early, and to gain successful results from treatment. The early diagnosis of cancer is so important that we are justified in making an unusual hemorrhage or discharge in a woman who has borne children, a reason for a vaginal examination. The use of the microscope in establishing a diagnosis of cancer has decided limitations, and while it will occasionally reveal cancer in doubtful cases, negative evidence of cancer by microscopical examination should not be relied upon, and an opinion had better rest upon the local and general symptoms. As a rule, the first signs of cancer are hemorrhage and leucorrhea; pain and loss of flesh come later. Cancer that begins as an outgrowth from the surface of the cervix resembles a growth of warts, papillæ, or granulations, and the surface feels uneven or rough. The disease may start as an ingrowth beneath the surface. It may be detected by an angry, livid, red spot, the surface of which is at first quite smooth. This angry color depends upon the vascularity caused by the new growth, and upon its tendency to break down, which leads to minute hemorrhages into the growth before the breaking down is extensive enough to make a breach of the surface. The livid surface of a cancer spot bleeds on being rubbed, so that a smooth, dark-red spot, bleeding on contact, is very suspicious. This is the earliest stage of cancer, and if a nodule can be felt, the suspicion is stronger. When the cancer has advanced to a cauliflower-like growth the diagnosis is quite certain.

The Results of Vaginal Hysterectomy for Affections of the Uterine Adnexa as compared with Abdominal Bilateral Ovario-Salpingectomy.

Jacobs (Brussels) (*Centralblatt für Gynäkologie*, No. 18, 1894), at the International Congress in Rome, relates the results of his own experience, and quotes the statistics of others regarding vaginal hysterectomy and ovario-salpingectomy as compared with the abdominal operation. He says that since the first International Gynecological Congress in Brussels, the question regarding total castration per vagina has progressed very much, and he believes that to-day there is ground for the argument that it will substitute the abdominal operation. He has performed vaginal castration in 184 cases, with 179 recoveries, a mortality of 2.71 per cent. This proves that the danger in the vaginal method is not greater than the abdominal, but is very much less. The combined statistics of Terrier, Terrillon, Doyen, Schauta, Chrobak, Zweifel, Martin, Jacobs, Lawson Tait, Dubois, and Gallot, with 1540 operations per abdomen, show a mortality of 5.7 per cent., while those of Richelot, Doyen, Péan, Segond, Rouffart, and Jacobs, with 690 operations per vagina, show a mortality of 4.49 per cent. It also must be remembered that frequently the vaginal operation was performed only because the abdominal was impossible. Therefore, with the same class of cases the mortality in the vaginal operation would be even less than these statistics show. The objection to this method has been that where the operation is once begun it must be completed; as in cases where during the operation only one side is found diseased. Jacobs says this is not justified, that the operation should be begun by opening Douglas's pouch, and immediately seeking with the finger for the adnexa. If both sides are affected, a total castration should be performed, but if only one side is found diseased, a unilateral vaginal ovario-salpingectomy is performed.

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A Suggestion in the Operation of Vesico-Vaginal Fistula.

E. R. Corson (*American Journal of Obstetrics*, August, 1894) describes a method of bringing the parts for operation well into view and within reach of the knife. The device is very simple and yet proved of great service in two cases, one of which had had two previous unsuccessful attempts at closure. A small hollow rubber ball, such as is found in toy-shops, is cut in half and a strong silk ligature is passed through the dome of this disk with the knot tied on the concave surface. The disk is pared down to such a size that it will enter the fistulous opening by drawing on the ligature, the vesical tissues are made tense and brought down into better view. This arrangement resembles in its effect the "goose egg" used by women in darning stockings. Through the counter-pressure of the disk the paring of the edges was greatly facilitated, especially in checking hemorrhage, which is so apt to blur the way of the knife. The introduction of the stitches is made very much simpler and is more quickly accomplished. After the sutures are placed, the disk can be removed by separating the sutures and compressing the disk by a pair of forceps, gently withdrawing it.

The Use of the Abdominal Drainage-Tube Determined by Bacteriological Examination.

C. B. Penrose (*American Lancet*, August, 1894) states that the use of the drainage-tube depends too often upon the caprice of the operator, rather than upon sound scientific principles.

Some operators never used drainage at all after any operation, and yet obtained exceedingly good results; while others obtained equally good results, and their statistics showed that they employed drainage in a proportion of their cases which varied, according to the individual taste of the operator, from 5 or 10 per cent. to 75 per cent. The general advice given by the advocates of drainage was, "When in doubt, drain." It was this element of doubt which caused the diversity of practice. Everything which increases our knowledge in regard to the facts which determine drainage diminishes our doubt, and brings about more uniformity of practice. The necessity for drainage in cases of hemorrhage lessens with the increasing experience of the operator, the use of the Trendelenburg posture, careful inspection of the area of operation, etc. The other reason for drainage is the septic character of the material which escapes or is retained in the abdomen. Knowledge in regard to this fact is of great importance in deciding about drainage in any case, and with the hope of gaining definite information touching this subject, the author during the past winter, at the University Hospital, had an immediate bacteriological examination made of the contents of every tubal and ovarian tumor, which was ruptured during removal. The report of the pathologist regarding the septic or aseptic character of the contents has determined his decision in regard to the use of the drainage-tube. The results of this plan have been most satisfactory, for out of a series of forty-six celiotomies, in which drainage was used but three or four times for hemorrhage, and only once because the microscope showed the material which escaped to be septic, there has been no case of peritonitis or sepsis. Reference is made to the report by Shauta (*Archiv für Gynecologie*, 1893, No. 44) of 192 cases of salpingitis, in 144 of which the contents were sterile, in 33 there were gonococci, and in 15 streptococci or staphylococci. Prior to the adoption of this method of bacteriological examination Penrose inserted a drainage-tube in every case of tubal or ovarian abscess, where the contents escaped into the peritoneum. Now he neither irrigates nor uses a

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drainage-tube unless the microscope shows these contents to be septic. The presence of gonococci in small numbers does not necessitate drainage.

Recently, the value of this method of practice was demonstrated by two cases operated on consecutively.

Each woman had a tubo-ovarian abscess, caused by sepsis at labor. In each case the abscess ruptured during removal, and the pelvis filled with pus.

In the first case the pus was found to be sterile, and the abdomen was closed without irrigation or drainage. In the second, the pus contained streptococci, and staphylococci, and the coli commune; consequently, the pelvis was thoroughly irrigated and drained. Both women recovered without peritonitis or sepsis, but the convalescence of the first was much easier than that of the second.

Cover-glass preparations of the material to be examined are made and fixed in the flame of an alcohol lamp, and stained with carbol-fuchsin. The microscopic examination is made with a Leitz one-twelfth immersion lens.

THE TREATMENT OF VESICO-VAGINAL FISTULA BY OPERATION FROM WITHIN THE BLADDER.

C. J. BOND (*Annals of Surgery*, October, 1894) reports two successful cases operated upon by this method which had defied previous attempts through the vaginal route. The cases specially suitable for this plan of operating are those in which there has been extensive cicatricial contraction. In such cases the vaginal roof is often tightly stretched across the pelvis and the neck of the uterus cannot be drawn down; if, under these conditions, the fistula be extensive and situated high up near the uterus, considerable advantage is obtained by choosing the new method. The steps of the operation are as follows:

First inject the bladder, while an assistant's finger blocks the fistulous opening; if this is impossible, it may be opened by a vertical incision above the pubes on a sound, the peritoneum being carefully drawn out of the way. The abdominal wall is incised either vertically or transversely, and the incision in the bladder is parted by three long curved metal retractors, and by these means and the upward pressure of the bladder by the assistant's finger in the vagina the fistula and field of operation are brought well within reach. The thin cicatricial junction of the two mucous membranes is now incised all around, and two flaps of vesical mucous membrane are raised, one on either side the rent, with their edges turned inward towards the bladder, and are sutured with catgut on a doubly-curved needle, such as is used for cleft palate suture; at this stage, also, the rectangular knives and long forceps are also useful, and care must be taken at the angles to extend the separation of mucous membrane beyond the actual limits of the fistula. A few silver-wire sutures are afterwards used to draw the edges of the vaginal mucous membrane together, these having been already freshened on their vesical surface by the operation within the bladder.

In the after-treatment it is very important to avoid the development of cystitis, and for that purpose continuous irrigation, day and night, with warm boric acid solution is advised.

The method of irrigation is as follows: After closing the fistula, a piece of rubber tubing is passed through the urethra and up into the bladder and out through the suprapubic wound. To the upper end of this tube is attached an irrigator, and as the water flows down it escapes into the bladder through a few small holes which had been cut in the sides of the tubing, and the lotion then passes through these holes again, after washing the cavity of the bladder, and passes out through the lower end of the tube into a receptacle provided.

By compressing the tube below the urethra, the bladder may be filled and

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flushed at will, the rate of flow can be easily regulated by pressure-clamps and the irrigator kept constantly warm by being wrapped in a cotton-wool jacket. The irrigation can be continued as long as desired, and the tube may be gradually dispensed with, by first drawing it within the bladder and allowing the suprapubic opening to close, and then removing it entirely.

There are two reasons which make the suprapubic method as reliable a means of closing fistulous openings in bad cases. (1) The vesical flaps are raised and turned inward and thus have their surfaces opposed to the direction of the current of urine flowing through the fistula, and are thus more tightly closed by its press, ure, unlike the flaps formed by vaginal mucous membrane; the vesical flap is the valuable agent in closing the opening. Moreover, in most cases of extensive loss of substance, the vesical mucous membrane has grown over the edge of the fistula, projecting into the vagina, and is more voluminous than the vaginal membrane.

(2) The suprapubic opening, especially where combined with the urethral drain and constant irrigation, insures complete drainage,—that is, the absence of all tension within the bladder. This is a most important factor, and is in itself sufficient in some cases to bring about a cure without further operation.

PATHOLOGY.

UNDER THE CHARGE OF

JOHN GUITÉRAS, M.D.,

ASSISTED BY

JOSEPH McFARLAND, M.D.

Experimental Researches upon the Products of the Tubercle Bacillus.

Maffucci (*Annals of Surgery*, Vol. xx, No. 5, November, 1894, p. 556), being convinced by experiments upon foul embryos that the general wasting in tuberculosis is due to the destroyed protoplasm of the bacilli acted upon by the embryos, secured a proof of this by experiments upon the sea-hog. Observing that sea-hogs inoculated with dead tubercle bacilli into the cellular tissue died marasmatic, with local and general symptoms, such as abscesses at the point of inoculation, hyperemia of the lungs, catarrhal pneumonia, endobronchitis proliferans and with hemorrhage, with parenchymatous and interstitial nephritis, atrophy of the liver, degeneration of the muscular fibre of the heart, and atrophy and pigmentation of the spleen. Death followed in from a few days to a month after inoculation. As in these diseased animals there were no tubercles, he concluded that a toxic substance capable of producing inflammatory and necrobiotic processes existed in the protoplasm of the dead bacilli capable of producing the described lesions.

Numerous experiments, showing the influence of temperature, desiccation, sunlight and high temperatures (100° F. for two hours), digestive juices, etc., upon the tubercle bacillus to be without influence upon its toxicity, were made.

The researches prove the original idea that *the dead tubercle bacillus contains a toxic product which has a great resistance against very potent physical agents.*

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Method of Securing Germ-Free Blood-Serum.

Kuprianow (*Centralblatt für Bakteriologie und Parasitenkunde*, Band xv, Nos. 13–14, 1894) recommends those who desire to secure germ-free blood-serum to introduce a small sterile canula into the jugular vein of the animal and draw off the blood without allowing it in any way to come in contact with the air.

The Occurrence of Bacterium Coli Commune in Living Blood.

Littman and Barlow (*Deutsches Archiv für klinische Medicin*, Band LII, Heft. 3 und 4, S. 252, ff.) found in a case of miliary abscess of the kidney a bacillus similar to the bacillus coli communis, not retaining the color when stained by Gram's method. Upon all culture media it grew exactly like the bacillus mentioned. Experiments upon animals, however, failed to produce lesions similar to that from which it was secured.

Sixteen hours before death puncture of the *vena mediana* showed the presence of the bacilli in the blood of the living individual.

A New Pathogenic Micro-Organism from Pneumonia Sputum.

Bunze-Federn (*Archiv für Hygiene*, Band XIX, Heft 3, S. 326) secured from the rust-colored sputum of a pneumonia patient a micro-organism pathogenic for mice and rabbits. It possesses a variable form both in culture and in blood. In the blood of the rabbit and guinea-pig it occurs as a short, somewhat thick rod, which in consequence of polar coloring much resembles a diplococcus.

In the blood of the white mouse it is longer, though of the same thickness, often double. In pigeons it is shorter with rounded ends. It does not color by Gram's method, grows slowly in gelatin without liquefaction, in bouillon causes cloudiness, but later transparency through precipitation to the bottom of the tube. No spores were observed, and the individual does not seem mobile. When inoculated subcutaneously rabbits die in from twelve hours to three days from septicemia. The bacteria can be demonstrated in the blood, in the transudation, and in sections of the tissues. Autopsies discovered enlargement of the spleen and hemorrhages.

Preparation of Diphtheria Antitoxine.

Aronson (*Berlin klinische Wochenschrift*, Nos. 18 and 19, 1894) finds that the antitoxic serum can be manufactured by immunizing calves, goats, sheep, horses, and dogs. He begins the immunization by injecting the animals with bouillon cultures of the diphtheria bacillus which have been exposed for one hour to the temperature of 70° C. After this, cultures exposed to 60° C. are used, then cultures to which trikresol has been added, the bacteria killed, and the cultures preserved. He found that the virulence of the cultures could be greatly increased by the application of oxygen to the cultures.

It seems difficult to immunize large numbers of animals, as they may be lost through too active treatment, and sometimes die without distinct pathological lesions, under which circumstances the greater the number under treatment, the greater the number lost.

To estimate the exact value of the serum of such prepared animals he uses the method of Behring and Ehrlich, and mixes with the toxine the smallest possible amount of the antitoxic serum required for its neutralization, determining the neutralization by inoculation into animals.

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A Case of Pneumonomycosis Aspergillina.

Kohn (*Deutsche medicinische Wochenscrift*, 1893, No. 50) describes a case of aspergillus infection of the lung occurring in a man 58 years old. He suffered in January, 1893, with severe hemoptysis, after which he had double pleurisy (?) in May, 1893. Three weeks later he entered the hospital suffering from severe dyspnea, and died June 17. The sputum was examined for tubercular bacilli with continuous negative result. The autopsy showed a round necrotic patch in the apex of the left lung, about four to five centimetres in diameter, surrounded by a dense infiltration. In the right middle lobe a similar small area surrounded by considerable edema was found. Examination showed these areas to be filled with fungous threads which Kohn recognized as aspergillus fumigatus. No cultures were made.

Pathological Considerations on Surgical Interference for Perforative Ulcer of the Stomach and Duodenum.

Kelynack (*British Medical Journal*, October 27, 1894, p. 914) examined the records of 3471 *post-mortems* made at the Manchester Royal Infirmary, finding 159 cases of acute peritonitis among them. Of these the number due to perforating gastric and duodenal ulcers is comparatively small,—six from each. Of the 157 cases nine were due to appendicitis.

Surgically the ulcers are divided into (1) gastric; (2) pyloric; (3) duodenal.

(1) *Gastric Ulcer.*—It is usually stated that gastric ulcers are most frequently met with on the posterior wall near the pylorus and towards the lesser curvature. The position, however, varies considerably, a fact of moment to the surgeon who finds the lesions *accessible*, *non-accessible*, or *accessible with difficulty*.

Sometimes the ulcers are situated on the anterior wall near the greater curvature, accessible; sometimes on the anterior wall near the lesser curvature, accessible with difficulty; sometimes near the smaller curvature and close to the œsophagus, *inacesssible*.

The ulcers are usually single. The edges of the ulcer are almost invariably thickened, rounded, and elevated. The surrounding tissue is often for some little distance extensively infiltrated. Sometimes the mucous membrane is undermined at the edges so as to produce a distinct cyst-like cavity. In one case the whole mucous membrane was thickened, evidently from a long-standing gastritis.

(2) *Pyloric ulcers* are of importance from the possible stenosis which may result.

(3) *Duodenal Ulcers.*—In the *post-mortem* reports of the Manchester Royal Infirmary on medical cases since the year 1867 only ten cases of undoubted primary duodenal ulcers appear,—all associated with burns and gall-stones, etc., being excluded as secondary. It is of interest to observe that all the cases recorded occurred in males. In seven the exact age being obtained, gave an average of thirty-three years.

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8000 deaths, while in the other city, which filtered its water, in a population of 145,000 there were but 516 cases, with 316 deaths. There were 283 deaths to every 10,000 people where unfiltered water was used, and only 36 to every 10,000 where the water was filtered.

The biological phase of the question, he said, was to consider the effect that impure water may have on health. In this connection he discussed the prevalency of typhoid fever, which, he said, was very high in Philadelphia, the average being 6.31 to 10,000 of the population. This is lower than that of Chicago, but higher than that of New York, Boston, Berlin, and Paris. It looked, he said, as if this disease should be charged to something used in common in the community,—air and water,—and the latter, by common consent, is believed to be the one that causes typhoid fever. The places where the deaths are fewer are where the water-supply has been purified. He showed how in Chicago the death-rate from the disease had been reduced by putting the in-take further out in the lake, and similar results had been obtained in other large cities, both in this and in foreign countries. If steps are taken here to correct the water-supply, he believed that it would result in a reduction in the mortality that would exceed the most sanguine expectations.

Dr. Leffmann, who followed, pointed out that the main object of the precipitation methods is to economize the filtering area, and that, by introducing in the water some ingredient which will collect the suspended matter in a coagulum, the operation of filtration takes place with greater rapidity. The best substance used to day in the purification of water, he said, is aluminum sulphate, as such or in the form of alum. In explaining the operation of this material, he said it removes any color from the water, as well as any turbidity, etc.

Dr. Leffmann also discussed the sand method of filtration, and that by the use of iron turnings. In the latter process the small pieces of iron are placed in a cylinder about as large as a hogshead, through which the water constantly passes. The iron is ground up slowly by the friction and rubbing, and by the chemical change that takes place the water is purified. He stated that he had had considerable experience with the iron method of filtration, and was satisfied that it was capable of doing good work, especially in waters decidedly turbid.

In reference to the subject of typhoid fever, Dr. Leffmann said that from the records of the board of health he found that in 1893 there were 453 deaths from the disease in the city proper. The district supplied by the East Park Reservoir, which includes Kensington, is tolerably free from typhoid fever, while in Kensington, when it received its water-supply from the station at Otis Street wharf, the mortality was much greater. In fact, the disease has mostly disappeared from the dis-

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trict, while in the district west of Broad Street, which receives its water-supply direct from the river, the disease is more prevalent. In Girard College, which is in this district, and which has about 2000 boys, there is scarcely a case of typhoid fever, because filtered water is used.

Dr. Pepper said that no community was in more urgent need of purified water than Philadelphia, where water is used to a larger extent than perhaps any city in the world. It was quite important, he said, that a method of filtration that had been shown to be so economical should at least be tried, pending a determination of the question of the ultimate water-supply of the city. He complimented the stand taken by Mayor Stuart and Director Windrim in advocating purification of the water by asking Councils for an appropriation for a filtering plant at Belmont, and urged the members of the Society to use their influence in promoting the scheme. For himself, he said, he did not permit his family to drink Schuylkill water unless it had been boiled, and the amount of drinking waters purchased by people, he said, was enormous and scandalous.

ALVARENGA PRIZE OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

THE College of Physicians of Philadelphia announces that the next award of the Alvarenga Prize, being the income for one year of the bequest of the late Señor Alvarenga, and amounting to about one hundred and eighty dollars, will be made on July 14, 1895, provided that an essay deemed by the Committee of Award to be worthy of the prize shall have been offered.

Essays intended for competition may be upon any subject in Medicine, but cannot have been published, and must be received by the Secretary of the College on or before May 1, 1895.

Each essay must be sent without signature, but must be plainly marked with a motto and be accompanied by a sealed envelope having on its outside the motto of the paper and within it the name and address of the author.

It is a condition of competition that the successful essay or a copy of it shall remain in possession of the College; other essays will be returned upon application within three months after the award.

The Alvarenga Prize for 1894 has been awarded to Dr. G. E. de Schweinitz, of Philadelphia, for the essay entitled, "Toxic Amblyopias."

CHARLES W. DULLES, *Secretary.*

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THE EXAMINATION OF GYNECOLOGICAL SPECIMENS.

In order to extend the usefulness of the Pathological Laboratory of the Gynecological Department of the University of Pennsylvania, the following plan has been adopted:

Any physician may send to the Pathological Laboratory any specimen for examination on which the diagnosis or the prognosis of a gynecological case may depend. A fee of five dollars will be charged for such examination in case the patient is able to pay. If the physician states that his patient is too poor to pay, the examination will be made free. The necessity for some arrangement of this kind, especially in making an early diagnosis of malignant disease of the uterus, is widely felt.

This offer applies to private, not to hospital, patients. The specimen should be placed in 95 per cent. alcohol, and directed to the Professor of Gynecology, Hospital of the University of Pennsylvania, 3400 Spruce Street, Philadelphia.

A brief history of the case should be sent with each specimen.

A report will be returned to the physician within two weeks after the receipt of the specimen.

ERRATUM.

In the article on Otomycosis, p. 527, May issue of the MAGAZINE, fifteenth line from the bottom, for "chrysolene salicylate" read "chinolene salicylate."

THE HORACE WELLS ANNIVERSARY CELEBRATION.

At the recent meeting of the American Dental Association at Old Point Comfort, Va., it was decided to hold a national celebration of the fiftieth anniversary of the discovery of the anesthetic properties of nitrous oxide, by Dr. Horace Wells.

The celebration will be held in Association Hall, Fifteenth and Chestnut Streets, Philadelphia, on Tuesday, December 11, 1894, at 2 P.M. The banquet will take place at the Union League the same evening.

Professor Thomas Fillebrown, of Boston, will read a paper upon the "History of Anesthesia," and Professor James E. Garretson, of Philadelphia, will deliver an address on the "Benefits of Anesthesia to Mankind."

A full report of the celebration, including the papers and addresses, will be printed and issued as a permanent souvenir of the occasion.

To cover the expenses attending the celebration, the fee for admis-

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sion to the banquet has been placed at $6.00. It is necessary that the committee shall have ample notice of the number who will be in attendance, in order that places may be provided for all who may desire to attend.

Subscriptions will be invited later for the souvenir volume, at a price sufficient to cover the cost of publication.

You are cordially invited to participate in this event, which should enlist the enthusiastic support of every member of our profession.

To that end you are requested to send your check and notify the chairman of the Anesthesia Committee, at the earliest date possible, in order that an official invitation may be sent to you.

It will be proposed at the meeting that subscriptions be invited for a permanent memorial, to take such shape as the meeting shall decide.

Signed,

LOUIS JACK,	S. H. GUILFORD,
E. T. DARBY,	WM. CARR,
C. N. PEIRCE,	A. L. NORTHROP,
D. N. MCQUILLEN,	H. B. NOBLE,
E. C. KIRK,	JAS. MCMANUS.

J. D. THOMAS, *Chairman*,
912 Walnut St., Philadelphia.

BOOK NOTICES.

WHERE TO SEND PATIENTS ABROAD FOR WATER CURES AND CLIMATIC TREATMENT. By DR. THOMAS LINN.

This little volume is one of the Physicians' Leisure Library. It contains in the first part some general remarks upon the various "cures" and baths and some good advice upon travel and diet. The last half of the book is occupied by an alphabetical list of the various diseases, each disease being followed by a list of the places at which such conditions are best treated. Each paragraph contains usually some general remarks upon the various methods of treating disease at the places mentioned.

If the volume be used as an index to the different health resorts, as the author evidently intends it to be used, it will be found of use.

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AN INTERNATIONAL SYSTEM OF ELECTRO-THERAPEUTICS: for Students, General Practitioners, and Specialists. By HORATIO R. BIGELOW, M.D., and Thirty-eight Associate Editors. Thoroughly illustrated. Philadelphia: The F. A. Davis Co., 1894.

This is certainly the most exhaustive work on medical electricity ever published in this country. The physics of electricity is treated of in numerous articles, all written by competent men of science. When we come, however, to electricity as a therapeutic measure, the book is somewhat unsatisfactory because too much is proven and too much is accepted without proof. If all that all the contributors write were true, electricity would be the most potent therapeutic agent we have. Indeed, it would be almost a panacea, would cure almost all diseases except the acute infectious fevers. It is a curious fact that so soon as a man becomes a deep student of electro-therapeutics, he loses that proper spirit of scepticism necessary to the man of science. The proof of this is shown everywhere throughout the work. The book also shows the lack of unity necessarily met with in a work composed by many authors. Notwithstanding the defects to which we have alluded, the work is a very valuable contribution to the literature of the subject, and ought to be owned by all who use electricity.

ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES. Edited by CHARLES E. SAJOUS and Seventy Associate Editors. Philadelphia: The F. A. Davis Co., 1894.

The present work marks the seventh annual publication of what has come to be an indispensable possession for those who desire to keep fully abreast with the medical literature of the day. The previous volumes have, in the main, been worthy of much commendation, but in the present work a distinctly higher tone is noticeable. This is to be explained by the valuable experience of the editor and his distinguished collaborators in bringing out the previous parts. In a work of this magnitude, there is an enormous amount of machinery to superintend, and the experience of each year adds greatly to the general improvement of the work, while it diminishes the mistakes and weak points. It would be impossible to produce a similar work with a corps of new editors without this previous experience. There are no new features in its publication, and the general plan and scope continue to be uniform with the previous volumes. It is impossible to mention all of the numerous reviews of the medical sciences, but those of Griffith on cholera and diseases of the intestines and peritoneum, of Wilson and Eshner on fever, of Lepine on diseases of the kidneys, etc., of Pilcher and Lloyd on surgery of the brain, spinal cord, and nerves, and others may be taken as representative of the work in general. The section on syphilis, by White and Furness, is of particular excellence. Numerous other reviews of merit are passed over, although equally worthy of mention. An important feature of the work is the excellent index, which at once refers the reader to any given disease, to treatment, or to the authors of publications upon any medical subject.

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TREATMENT OF TYPHOID FEVER. By D. D. STEWART, M.D.

This monograph, published by George S. Davis, at Detroit, in 1893, is a complete *résumé* of the present treatment of this important disease. The description of the cold-bath treatment is especially good. The chapter devoted to the specific and antiseptic treatment leaves nothing to be desired except, perhaps, the mention of salol, which is certainly an important and useful drug in the disease. The book is well worth reading, and deserves a place in the library.

CHEMISTRY: GENERAL, MEDICAL, AND PHARMACEUTICAL, INCLUDING THE CHEMISTRY OF THE U. S. PHARMACOPEIA. A MANUAL ON THE GENERAL PRINCIPLES OF THE SCIENCE, AND THEIR APPLICATIONS IN MEDICINE AND PHARMACY. By JOHN ATTFIELD, F.R.S., Professor of Practical Chemistry to the Pharmaceutical Society of Great Britain, etc.

This work has long been a standard, and will need no introduction now. It occupies a unique position, for, although it is a complete manual of chemistry, it has been arranged and especially adapted to the needs of the physician and pharmacist. It also stands apart in these particulars: (1) The exclusion of matter relating to compounds which at present are only of interest to the scientific chemist; (2) in containing more or less of the chemistry of every substance recognized officially, or in general practice as a remedial agent; (3) in the paragraphs being so cast that the volume may be used as a guide in studying the science experimentally. The work is made to correspond with the last edition of the United States Pharmacopeia. Among other chapters of particular interest are those relating to the chemistry of substances, met with in vegetables and animals, and chemical toxicology. The present edition contains such alterations and additions as seemed necessary for the demonstration of the latest developments of chemical principles, and the latest applications of chemistry to pharmacy. The fact that this work now appears in its fourteenth edition is abundant proof that it supplies a distinct want.

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UNIVERSITY
MEDICAL MAGAZINE.

JANUARY, 1895.

STRONTIUM SALICYLATE.

By H. C. Wood, M.D., LL.D.,
Professor of Therapeutics in the University of Pennsylvania.

The medical world everywhere recognizes that the salicylates are valuable in the treatment of rheumatic and gouty affections, and that their usefulness is often interfered with by the great tendency which they have to derange digestion. In common, I suppose, with most practitioners of medicine, for some years I have been trying to find some way of getting the general action of the salicylates without gastric disturbance. At one time most of my patients received oil of gaultheria, which certainly in many cases is less disturbing to the gastric mucous membrane than is the salicylic acid or the sodium salicylate. Subsequently, however, I found that the ammonium salicylate, given in milk, was usually much better borne than was even the oil of gaultheria. In the earlier editions of my Treatise on Therapeutics it was recommended to dissolve salicylic acid in water by the cautious addition of ammonia, but this crude method of preparing ammonium salicylate was in turn replaced by the use of the ammonium salicylate as made by the manufacturing chemist. In Philadelphia at least, and presumably in other places, the ammonium salicylate has come largely into use. It is a freely soluble salt, which is rapidly absorbed, and rapidly produces, when given in sufficient amount, the cinchonism that marks the salicylic action. Strangely enough, it was not only not made official in the late revisions of the British and United States Pharmacopeias, but is not even mentioned in the recent editions of the United States Dispensatory, nor in the new National Dispensatory; an omission which is the more strange, at least so far as the United States Dispensatory is concerned, because I daily prescribe the salt. Hith-

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erto it has certainly offered the best method of administering the salicylates for ordinary purposes, and I believe that when an immediate powerful impression is desired, it still remains the best remedy of its class.

My own clinical experiments closely accord with the statements of Laborde, that the haloid strontium salts agree with the human digestive apparatus very much better than do the corresponding salts of sodium and potassium; and it occurred to me that very possibly the strontium might be able to overcome the disagreeable effects of salicylic acid. At my request, Rosengarten & Sons, manufacturing chemists, very kindly prepared for me the salt, which occurs in an irregularly, coarsely crystalline powder, or, as it was furnished to me by the chemists, finely pulverized. According to the determination of Professor Wormley, it is soluble in 31.25 parts of cold water, but by means of heat a permanent 6-per-cent. solution can be made. In the proportion of its salicylic acid it compares with the sodium salicylate as 1.4 does to 1 (161 parts of sodium salicylate equalling 138 parts of salicylic acid).

When given intravenously in fatal dose to the dog it produces death through the respiration, followed almost at once by an extraordinary post-mortem rigidity. In some instances there was vomiting, but never purging.

In order to determine whether it has any distinct depressing influence on the circulation, experiments upon dogs were made with it; and also, for control, with the sodium and ammonium salicylate.

Experiment I.—Dog, weighing 28.6 kilos *Sodium salicylate*, 6-per-cent. solution. The arterial pressure was not distinctly affected by the intravenous injection of 100 cubic centimetres; after 40 cubic centimetres more there was a rise of 10 millimetres in the arterial pressure, which was maintained for between one and two minutes, when under the influence of another 20 cubic centimetres the pressure began to fall slowly. Another 20 cubic centimetres being given the rate of fall was increased; when the arterial pressure had decreased from 180, the norm, to 52 millimetres, the respiration ceased; the heart continuing to beat for half a minute longer.

Experiment II.—Dog, weighing 21.4 kilos. *Ammonium salicylate*, 6-per-cent. solution. The rapid injection of 20 cubic centimetres of the solution into the jugular was followed by a pronounced immediate fall of pressure followed in a few seconds by a rise; after repetition until 80 cubic centimetres had been injected the pressure rose to 20 millimetres above the norm. This rise was increased 16 millimetres by the further gradual injection of 80 cubic centimetres of the solution. During the very slow injection of 40 cubic centimetres more the

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pressure remained about the same until the whole had been given, when violent tetanus developed, and the arterial pressure rose to 56 millimetres above the norm, only to rapidly fall a half minute later, when the muscles relaxed during quiet to 112 millimetres below the norm. Ten seconds after this respiration ceased, the heart continuing to beat for twenty seconds, and the arterial pressure gradually descending to zero.

A study of these experiments will show that with the sodium salicylate there was a slight rise of pressure, which was followed by a fall when 5.6 cubic centimetres of the solution per kilo. had been injected; with the ammonium salicylate a great rise of pressure occurred, followed by a fall when the injected solution amounted to 9.5 cubic centimetres per kilo. A study of these results brings into relief the stimulating influence of the ammonia in contrast with the inertness of the soda. It is evident that in the salicylates the physiological properties of the base are not without influence upon the paralyzing action of the toxic dose of the salicylic acid.

As I am not aware that any experiments of the strontium salicylate upon the circulation have been made, I record two experiments in greater detail than those just given.

EXPERIMENT. Dog; weight, 20 kilos.; 3-per-cent. solution of the strontium salicylate, given by intravenous injection into the jugular.

Time. h. m.	Dose.	Pulse.	Pressure.	Remarks.
0.	. . . . .	220	128–138	
0.1	10 c.c.	. . .	. . . . .	
0.30	10 "	. . .	. . . . .	
0.40	. . . . .	204	130–150	
1.40	10 c.c.	. . .	. . . . .	
1.55	. . . . .	. . .	130–150	
3.00	20 c.c.	. . .	. . . . .	
3.55	. . . . .	. . .	130–140	
5.00	30 c.c.	. . .	. . . . .	
5.40	. . . . .	. . .	130–140	
6.00	10 c.c.	. . .	. . . . .	
6.10	10 "	60	130–160	Pulse suddenly altered in character.
6.25	20 "	. . .	. . . . .	
6.35	. . . . .	. . .	140–175	
7.05	. . . . .	. . .	140–200	Dog vomiting.
7.15	. . . . .	. . .	140–260	Dog vomiting.
7.30	30 c.c.	. . .	. . . . .	
7.55	. . . . .	. . .	150–190	
8.05	10 c.c.	. . .	. . . . .	
8.10	. . . . .	. . .	150–180	
8.25	10 c.c.	. . .	. . . . .	
9.25	. . . . .	. . .	160–170	
10.25	10 c.c.	. . .	. . . . .	
12.25	. . . . .	. . .	150–160	
20.25	. . . . .	. . .	150–160	Dog quiet.

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EXPERIMENT, November 17, 1894. Dog; weight, 13.152 kilos.; 6-per-cent. solution of the strontium salicylate used.

Time. h. m. s.	Dose.	Pulse.	Pressure.	Remarks.
4.14	. . . . .	27	146	
4.15.10 to 40	20 c.c.	. . .	. . . . .	
4.15.20	. . . . .	. . .	164	Struggling.
4.15.40	. . . . .	. . .	152	
4.16	. . . . .	. . .	166	Struggling.
4.18	. . . . .	19	150	Quiet.
4.19	. . . . .	19	144	
4.19.10 to 25	20 c.c.	. . .	. . . . .	
4.19.30	. . . . .	. . .	166	Struggling.
4.20	. . . . .	. . .	162	Struggling continues.
4.21.30	. . . . .	20	154	Slight struggling.
4.22.4to22.20	20 c.c.	. . .	. . . . .	Quiet.
4 22.20	. . . . .	. . .	166	Struggling.
4.23.30	. . . . .	. . .	148	
4.23.30 to 40	10 c.c.	. . .	. . . . .	
4.23.50	. . . . .	. . .	. . . . .	Continuous struggling.
4.24	. . . . .	. . .	158	
4.24.4to24.20	10 c.c.	. . .	. . . . .	
4.24.30	. . . . .	. . .	172	
4.25	. . . . .	23	170	Quiet.
4.25.4to25.10	10 c.c.	. . .	. . . . .	
4.27.30	. . . . .	. . .	156	
4.27.40 to 50	10 c.c.	. . .	. . . . .	
4.28	. . . . .	. . .	166	
4.28.4to28.10	10 c.c.	24	164	Struggling.
4.29.4to29.10	10 c.c.	. . .	162	
4.29.20	. . . . .	. . .	158	Struggling.
4.29.30 to 40	10 c.c.	. . .	158	
4.30	. . . . .	35	160	Slight struggling.
4.30.4to30.10	10 c.c.	. . .	. . . . .	
4.30.20	. . . . .	. . .	160	Struggling.
4.30.30	. . . . .	. . .	154	
4.30.40 to 50	10 c.c.	. . .	. . .	
4.31	. . . . .	. . .	134	Struggling.
4.31.30	. . . . .	. . .	118	
4.32	. . . . .	. . .	108	Struggling.
4.33	. . . . .	. . .	98	
4.33.30	. . . . .	. . .	52	
4.33.40	. . . . .	. . .	. . . . .	Respiration stopped. Heart continued twenty seconds (to 4.34).

In examining the records it will be seen that in the first experiment 210 cubic centimetres of a 3-per-cent. solution, equal to 105 cubic centimetres of a 6 per-cent. solution, increased the arterial pressure markedly in a dog weighing 20 kilos.; so that over 5 cubic centimetres of a 6-per-cent. solution of strontium salicylate per kilo., intravenously injected, raised the blood-pressure 22 millimetres.

In the second experiment, after the injection of 150 cubic centimetres of a 6-per cent. solution of strontium salicylate in a dog weighing 13 kilos., the blood-pressure was still above the norm; although a few seconds later an additional injection of 10 cubic centimetres was followed by rapid fall of pressure, ending in death by respiratoy arrest;

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the heart continuing to beat distinctly twenty seconds after respiration had stopped. In other words, 11 cubic centimetres per kilo. of a 6-per-cent. solution of the strontium salicylate intravenously injected in broken doses for a length of time did not produce any immediate fall of pressure.

Contrasting these results with those obtained with sodium and ammonium, it will be seen that the dose of the strontium salicylate necessary to lower arterial pressure was nearly twice that of the sodium salicylate, and distinctly more than that of the ammonium salicylate.

With the knowledge acquired by animal experimentation it seemed to me entirely safe to use the strontium salicylate in human medicine, and I have accordingly employed it in a large number of cases in doses of from 15 to 120 grains a day. The result of these trials is to show that in doses of 5 to 10 grains, given after meals, the salt very commonly improves digestion, and in the dose of five grains an hour after meals, in flatulent dyspepsia and various conditions of tendency to fermentative changes in the alimentary canal, it is a useful intestinal antiseptic, which has seemed to me to give better results than do salol, naphthol, or other of the older intestinal antiseptic remedies. It does not produce cinchonism as readily as do the older salicylates, but it is entirely capable of causing a pronounced degree of cinchonism. I have not been able to test it in acute articular rheumatism, but it would probably be less efficacious than the ammonium salicylate. In muscular or subacute rheumatism as well as in chronic gouty conditions with a tendency to digestive disturbance, I have found it to be a very valuable remedy, exerting the action of the salicylate upon the diathesis, and improving instead of injuring the digestion. It may be given in solution, but is best administered in capsules; a five-grain capsule is of moderate size, and of these two or more may be taken at once. It is probable that it would be well administered in compressed tablets, but in this way I have not tested it. The taste of this salt is similar to but distinctly less offensive than that of the ordinary salicylates, so that if preferred it may be given in weak solution.

For Bronchitic Asthma.

℞	Ext. stramonii	gr. ⅛.
	Potassii iodid.	gr. v.
	Ammonii carb.	gr. iv.
	Tinct. lobeliæ æther.	♏v.
	Aquæ chloroformi ad	f℥ss.—M.

Sig.—A tablespoonful every four hours.

—*Practitioner.*

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THE ABNORMALITIES OF OCULAR BALANCE: THEIR NATURE, ETIOLOGY, CONSERVATIVE MANAGEMENT, AND OPERATIVE TREATMENT. A CLINICAL STUDY.[1]

By S. D. Risley, M.D.,

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Clinical observation has shown that in a large number of patients suffering from asthenopia there are present not only errors of refraction, but also certain abnormalities of ocular balance. No fact in the practice of medicine is more universally conceded, or has been received with more enthusiasm, than the signal value which accrues to the patient from the careful correction of the errors of refraction by optical means. As experience in the treatment of asthenopic patients increased, however, it became more and more obvious that some other factor was often operative in causing the symptoms, since the most careful corrections, in a considerable number of persons, failed to afford relief. The wisest attention to the general health and the exclusion of all possible reflexes were equally futile in relieving the symptoms, which were plainly due to ocular conditions, and hence these patients wandered from one consulting room to another, or from city to city, in search of relief. A careful study of local conditions demonstrated that in a considerable group of these patients there was present some disturbance of binocular vision, which seemed to be the cause of the continued discomfort and inability to use the eyes. The recognition of the fact that disturbances of motility were a source of visual disturbance was by no means new.

Notwithstanding its early recognition, however, and the fact that the essential physiological principles underlying the disturbance had been pointed out by Donders in 1846, its full clinical significance does not seem to have been recognized even by this astute observer. Having demonstrated the physiological conditions of binocular vision in emmetropic eyes, and noted the modifications which took place in ametropia, the clinical significance which seems principally to have impressed itself upon his mind was the relation of hypermetropia to strabismus, the so-called insufficiency of the interni, and certain mechanical disturbances in the large myopic ball. Clinical research has, however, given

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a wider range of importance to the relation which obtains between the functions of accommodation and ocular motility.

Comfortable vision with two eyes depends upon the harmonious relation of so many factors—anatomical, physiological, and optical—that we should not find cause for surprise if, in so complex a system, we should observe frequent disturbance of function growing out of abnormal variations in one or more of these factors.

That the harmony of these relations would be frequently disturbed was indeed to be anticipated. Aside from the liability of disturbance from various forms of disease, which would interfere with the proper function of the ocular muscles or their innervation, it was only reasonable to expect that the complex visual apparatus would be subject to anatomical variations, as, for example, in anomalies of form in the eyeballs, or anomalous distribution in the complex system of muscles, or less gross anomalies of development in the muscles or their nerve-supply, any or all of which would of necessity introduce disturbances of binocular vision. That such anomalous conditions are liable to befall the eyes is suggested by the rarity of anatomical perfection in the human frame. That the eyes are, however, peculiarly liable would seem to be indicated by the very frequent distortions of the human skull. Any cursory study of a hatter's forms taken as patterns from the heads of his patrons will show that very many heads are so ill shaped as to appear grotesque when compared with the diameters of a model skull. It is highly probable that these anomalous forms of the skull modify the form and dimensions of the orbits, doubtless to the more or less serious detriment of the developing eyeballs which the orbits are designed to enclose and protect. It is certainly not unreasonable to expect that during development in an anomalously-shaped orbit, not only certain modifications would occur in the form of the eyeballs, which would change their diameters, and consequently alter their radii of curvature, but also would lead to changes in the length and line of direction of the optic nerves, and the origin and attachment, the length and direction of the ocular muscles; conditions, one or all of which would lead to more or less marked disturbance of motility, and in many complex ways modify the conditions of binocular vision.

The great frequency of heredity of the hypermetropic and astigmatic eye is a fact subject to every-day observation. It was long ago pointed out that a certain type of face was characteristic of the hypermetropic eye,—viz., the flat face, just that form which favors the shallow orbit. In this connection it is interesting to note as bearing upon the contention here made, and upon the heredity of refraction defects, that the shape of the skull is the main anatomical factor in determining the family likeness.

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When we add to these congenital defects of structure and relation the ravages of disease, either affecting the eye itself, or its essential anatomical connections, it is obvious that, in the elucidation of the abnormalities of binocular vision we have placed before us many obscure and complex problems. Any extended experience forbids dogmatic statement regarding their nature or treatment.

The great conservatism so often displayed by nature in adapting the means at hand to the required end doubtless overcomes in great measure the baneful influence these anomalous relations would otherwise exert over binocular vision. For example, the growing child, under the demands of a steadily-increasing experience, gradually moulds, during the plastic years of growth, the existing conditions to meet, more or less successfully, the felt requirements of experience, and victory is thus often won where from *a priori* reasoning defeat would have seemed inevitable. Unfortunately, the final outcome is very frequently a failure, or at best but a partial success, and the child passes into adolescence or adult life with defective vision, and a heritage which, unrelieved, will handicap him in any ambitious career.

It is the resulting group of conditions which is before us for study.

It is quite impossible in brief space to discuss the subject in all its bearings, since this would lead to a treatise on the anomalies of vision. I shall therefore confine myself to such a grouping of the abnormalities of ocular balance as seems justified by clinical experience, and incidentally discuss their relation to the errors of refraction and accommodation, since in a very large and important group they sustain the relation of cause and effect.

Ideal Conditions for Comfortable Binocular Vision.—It is essential for diagnosis and the adequate elucidation of anomalous conditions that we should have before us some ideal or standard of vision with two eyes to which anomalous conditions may be referred for comparison. Great confusion obtains at this point. Ideal relations will be found in two emmetropic eyes with normal sharpness of vision, a physiological range of accommodation, and a proper ocular equilibrium,—that is to say, emmetropia, with $V = \frac{6}{vi}$ for each eye and a binocular range of accommodation and convergence from infinity to the *punctum proximum*, corresponding to the age of the individual. Under these ideal conditions a clear image of the approaching object is maintained upon the fovea of each eye from infinity to the binocular near point. In point of fact, this ideal condition is rarely observed; nevertheless, the eyes which most nearly approach it enjoy the highest degree of comfort, and meet the visual requirements of civilized life with a minimum of pain and peril. Reasoning *a priori*, any disturbance of one or more of

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these factors must introduce discordant conditions and lead to disturbance of function.

For our present purpose it is especially important that we should have some definite standard for the relative value of the several extra-ocular muscles. If we consult the text-books as to the dynamic relation,—*e.g.*, between abduction and adduction,—no satisfactory clinical answer is given.

The power of abduction will with some uniformity be placed at from six to eight degrees, as measured by the ability to maintain single vision with abducting prisms. But adduction is a variable quantity, ranging from twenty to forty or even sixty degrees. The ability to overcome prisms with the base upward or downward is uniformly placed at two to four degrees. The confusion, therefore, lurks around the sliding scale given to the power of convergence. It is nevertheless, for purposes of diagnosis, essential that some definite relation should be fixed between abduction and adduction for normal eyes. The ratio in the books is one of abduction to six or even ten of adduction. I have been convinced that this ratio is incorrect, being much too high for adduction. The great range given to the power of adduction, and the great uncertainty which must therefore obtain in the study of any individual case as to the proper ratio between adduction and abduction, grows out of improper methods of measurement and from the fact that only selected cases can be employed in the determination of a proper standard. I formerly supposed that the power of adduction was simply an uncertain quantity, which not only varied from day to day, but at different trials on the same day, and so taught my classes. This belief retarded my work in the management of muscular errors for a long time. But additional experience and more accurate methods have shown that I was in error. In order to secure a more definite working basis I have improved every opportunity to measure the ocular balance by a uniform method in every suitable case. Non-asthenopic eyes were chosen, all of which were approximately emmetropic, or patients who had worn correcting glasses comfortably for a considerable length of time, in some of the recorded cases for many years. All were under 40 years of age, and had $V = \frac{6}{vi}$ for each eye. Orthophoria was shown to exist at six metres by the Maddox rod, vertical diplopia, and cover test. *These conditions I regard as essential in determining the normal ratio between abduction and adduction.*

Next they were all measured while sitting in a position of rest before my optometer, the eyes being in the primary position. The test object was a small point of light placed at six metres before a dead

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black background, at the same height as the patient's eyes above the floor. A candle-flame is too large for accurate work. A rotary prism was placed before each eye and accurately levelled. When these are properly centred in the fixed apparatus I have devised, the patient gets a single circular field of observation (as in looking through a well-centred pair of opera-glasses), in the centre of which is the observed point of light.

The prisms were then slowly but steadily rotated in the direction to secure their abducting power. At the instant diplopia was produced the prisms were turned back into a neutral position and the patient given repeated opportunities to verify the first result. For *abduction* the average result in twenty-five cases, all of which fulfilled in every particular the above conditions, was 8.10 degrees. To determine the power of adduction the rotation was made in the opposite direction in precisely the same manner, repeated trials being made for verification. The average adducting power in the same cases was 25.04 degrees. The following table shows the result in each case:

No.	1	Abduction	10	Adduction	30
"	2	"	7	"	22
"	3	"	3	"	8
"	4	"	8	"	25
"	5	"	6	"	18
"	6	"	6	"	18
"	7	"	7	"	22
"	8	"	8	"	24
"	9	"	8	"	24
"	10	"	11	"	34
"	11	"	6	"	18
"	12	"	6	"	18
"	13	"	8	"	25
"	14	"	10	"	29
"	15	"	8	"	25
"	16	"	8	"	24
"	17	"	8	"	24
"	18	"	10	"	30
"	19	"	12	"	36
"	20	"	12	"	36
"	21	"	9	"	27
"	22	"	6	"	18
"	23	"	12	"	36
"	24	"	6	"	18
"	25	"	8	"	24

They were all non-asthenopic eyes, and were all measured in the manner described. In almost every case where the ratio differed from the figures in this table the Maddox rod would reveal a lateral deviation

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which sustained a quite definite relation in degrees to the variation from the ratio here shown, which *is as one to three.* To reach these results the same conditions, however, must be observed,—viz., two emmetropic or carefully-corrected eyes, with normal acuity of vision and range of accommodation in each. Remove the correcting glasses for a few moments and both the rod and ratio of abduction and adduction give changed results in the same case. The method described is also important. In order to test the relative merits of my former methods I placed successively stronger prisms in the spectacle frames. In *abduction* I found but little variation from the above results, but in *adduction* the result was widely different. Diplopia resulted at first at approximately the same degree as above noted, but the double images would be almost immediately fused, the image of the point of light becoming either very small and apparently too remote, or blurred, and then prisms could be added almost indefinitely up to forty or more degrees, but after their removal it required some time for the muscles to relax, and the rod would reveal a considerable degree of homonymous deviation even after relaxation had apparently taken place, showing that, not the normal adducting power had been measured, but the utmost strength of the internal recti which it was possible to exercise in conjunction with the power of accommodation, both being in a state of cramp. It is obvious that this is not the standard by which we wish in any given case to compare the habitual abduction or adduction power in other and questionable cases.

When determined in the manner I have urged, it will be found, when the ratio between abduction and adduction varies much from the figures given—*i.e.*, one to three—that the rod, vertical diplopia, or the cover test will, one or all, reveal a lateral deviation of the eyes when held in the primary position.

This relation can, I am sure, be safely accepted as a standard by which to compare the measurements in cases of anomalous muscular balance. I have used it habitually for a long time, and have demonstrated its utility as a practical working basis.

To determine the vertical balance the rotary prisms are placed in the horizontal position, and left or right supra- and infraduction carefully determined. Both should be equal in every properly-balanced pair of eyes.

The Abnormalities of Ocular Balance, their Nature and Etiology.—In any study of the anomalies of ocular balance the possibility of a pathological origin should be borne in mind. The well-known fact that the insidious approach of tabes is frequently displayed in disturbed innervation of the ocular muscles, I have again and again seen overlooked, and in one case a tenotomy had been performed for a sup-

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posed exophoria of peripheral origin. In another a favorable prognosis was given as to the results of local treatment. In other cases irregularities of ocular balance disappear when foreign sources of irritation are removed. In this connection I recall the case of a young woman, which will serve to illustrate a large group, who suffered greatly from eye symptoms which seemed to be due to muscular anomaly, but which promptly vanished after the introduction of a pessary by her physician. Pressure in the nostrils produced by hypertrophies, bony spurs, malformations of the turbinated bones, etc., are a quite frequent source of irregular ocular motility, but such cases have rarely presented any fixed and measurable anomaly.

I have seen a most marked spastic convergence disappear in a child after a dose of castor oil.

Again, they are sometimes temporarily present as the result of some general dyscrasia, as rheumatism or gout, either affecting one or more of the ocular muscles or producing tenderness of the ball itself, so that any muscular movement is painful, and thus simulating faulty balance.

Granular changes at the macula in one eye sometimes simulate muscular disturbance through the effort which is made to have the image projected upon a healthy part of retina contiguous to the small scotoma. It is not, however, with the large group of patients suffering from abnormalities of a pathological or reflex origin that we are interested in this discussion.

There are two classes of muscular defect which are also excluded from any special consideration in this study,—viz., strabismus and paralysis of the ocular muscles.

In omitting them, however, I do not wish to be understood as regarding the first as necessarily of an essentially different origin from many of the cases of anomaly included in the discussion. They have this in common, an abnormal ocular balance, but in strabismus there is monocular vision, while in paralysis, there is binocular vision, but a recognized diplopia. In the group now to be considered, while there is an abnormal ocular balance, there is, nevertheless, binocular single vision, the latter being more or less steadily maintained by a conscious or unrecognized muscular tension, which is often an important factor in causing asthenopia and frequently gives rise to distressing and more or less obscure reflex nervous symptoms.

Anomalies.—The departures from the ideal standard of binocular vision to be considered are susceptible of a somewhat definite grouping for clinical purposes.

(1) The gradual disturbance which occurs even in approximately emmetropic eyes with the inevitable approach of presbyopia.

(2) That which results from congenital abnormalities in the form of the eyeball, as in ametropia.

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(3) Those which result from congenital abnormalities in the ocular muscles, possibly in their origin or attachments, length and direction, growing out of congenital distortions of their osseous environment.

(4) Those which are the result of disease, either recent or remote as to time, and affecting either the muscles themselves or their innervation.

No study of any case is complete that has not considered the possibilities presented in this grouping.

Very much of the confusion which reigns in the journal literature of this subject would have been avoided by a more careful study of the principles long since laid down by Volkman, Nagle, and Donders. This is certainly true so far as the first and second groups are concerned. While their demonstrations of the relation which obtains between convergence and accommodation are well understood by many, the principles underlying their work do not seem to have found the considerable place in the daily routine of the office or clinic which their importance demands. After these many years we cannot do better than to go back to the admirable work of Donders for instruction. While this great physiologist may not have seen the full clinical significance of his demonstrations, he has, nevertheless, with marvellous penetration and scientific accuracy, laid down the law which must guide us in our subsequent study.

Since the functions of accommodation and convergence have a common innervation, it would seem that their harmonious action is absolutely essential to satisfactory binocular single vision at any given point. In ametropia this would seem impossible, since, under a common innervation, the same sentient impulse would be given to both convergence and accommodation. Volkmann, however, in 1836, and Donders ten years later, demonstrated that there was a certain and quite definite degree of independence between these two functions for emmetropic eyes,—viz., that within certain well-defined limits the eyes could be converged without accommodating and could accommodate without converging. Later Donders pointed out that a like independence existed also in ametropia, and with much ingenuity he constructed curves to graphically illustrate the law. These curves differed widely for emmetropia, myopia, and hypermetropia. He observed, however, that as age advanced, even in emmetropic eyes, the curves steadily approached those which characterized hypermetropia. On the other hand, in both hypermetropia and myopia, where correcting glasses had been worn, the curves were those of emmetropia. These demonstrations are of signal clinical importance.

It is obvious that in presbyopia, with its diminishing range of accommodation, and in all ametropic eyes, were it not for this region

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through which the convergence and accommodation may be used with some degree of independence, satisfactory binocular vision would be impossible.

In considering the etiology of these affections of muscular balance it will be found that a disturbance of the normal relation between the accommodation and convergence is by far the most frequent cause. The simplest expression of the condition is found in emmetropic eyes or those with the lowest grades of hypermetropia at the age of beginning presbyopia. That the discomfort and unsatisfactory vision experienced at this time of life are not solely due to the receding near point may be demonstrated by placing before such patients weak adducting prisms. The additional work thus placed upon the interni (the converging muscles) will, for a time, quite as effectually remove discomfort as the use of a weak convex glass designed to relieve the strain upon the diminishing power of accommodation. Both expedients act by restoring the accustomed relation between these two functions, which has been disturbed by the approaching presbyopia.

Since the physiological fault lies not in the convergence but in the diminished range of accommodation, the more scientific expedient is the convex glasses to relieve the strain upon the accommodation, which a few years later would in any event become a necessity.

This physiological law serves, however, to illustrate the principles involved in the second group,—viz., the ametropic eyes. The discordant relation which is seen to occur gradually in presbyopia occurs also in every case of hypermetropia, but begins earlier in life, and therefore at a time when adaptation is most readily effected. The power of accommodation necessary to neutralize the hypermetropia must be exerted from the very outset, even for distant objects.

In order to avoid homonymous diplopia the convergence power must be held in abeyance, the ability to do which is acquired much as the skilled musician learns to employ independently the different fingers of his hand, even those with a common innervation, an ability which most of us do not possess in any marked degree. As age advances and with it a steadily diminishing range of accommodation, the relative sentient innervation supplied to these closely-allied functions must bridge a constantly widening gap until, at last, a point is reached where the necessary accommodation impulse cannot be exerted without using also the power of convergence. It is probable that it is at this point that the disturbance of vision and the asthenopia begin, which, in point of time, will depend upon the grade of hypermetropia, and, probably, also upon certain individual facility of adaptation. *I have convinced myself that the relative range of accommodation and convergence is much greater in some persons than in others, all other things being*

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equal. Indeed, many persons never acquire the ability to accommodate independently of the convergence, and from these are recruited a large group of the cases of so-called esophoria, and strabismus convergence.

When visual disturbance presents itself in the hypermetrope the only scientific expedient is the correction of the hypermetropia by convex glasses. These introduce a new and disturbing factor into the visual act. The relative range of accommodation and convergence acquired by the habit and experience of a lifetime is suddenly disturbed by relieving the accustomed tension upon the accommodation, before required even for distant vision. If the hypermetropia is fully corrected an equal tension must now be exerted upon both convergence and accommodation, and this the individual is unaccustomed to do.

The result is a *relative insufficiency* of the interni, to overcome which an innervation impulse is exerted relatively too great for the accommodation which is now needful with the glasses, and which he cannot but exert. The clinical effect is to cause indistinct distant vision through the glasses, and he returns with the statement that they are not suited to his eyes since they blur his vision. This is a daily experience in most consulting rooms, where approximately full corrections are given. This relative insufficiency is the explanation of the erroneous claims which have so long passed current regarding a certain tone of the accommodation, and also gives encouragement to the surgeon who insists upon giving manifest corrections, which are in the nature of a compromise. This practice is not to be entirely condemned in cases of simple hypermetropia, since it allows time for the gradual acquisition of a new relative range as successively stronger glasses are given. The case is different, however, where astigmatism is also present, where the error differs in the two eyes, since careful corrections are here necessary, and where the relative range has never been acquired. In treating this group two courses are open to the surgeon. He may adopt the compromise method of manifest corrections, or may under the thorough use of a mydriatic radically correct the total defect. In the latter case he may apprise his patient of the probable annoyance from dim vision as soon as the effect of the mydriatic has disappeared, but may at the same time assure him that this will soon disappear if he persists in the use of his glasses, which, in fact, it will speedily do in most young people, as they rapidly acquire a new relative range. In older patients, however, the case is by no means so promising, and something must usually be done to aid them in acquiring a new and harmonious relation between convergence and accommodation. This is done by a judicious and systematic training of the convergence. These are the patients who have in late years been too frequently victimized by the enthusiastic advocates of tenotomy.

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This can be done quite rapidly in a large number of patients by the judicious use of adducting prisms. For this purpose it has for many years been my custom to lend these patients a pair of square adducting prisms, from a set kept for the purpose, and carefully instruct them in their use. The method pursued was to give the strongest prisms which could be overcome at a distance of a few feet, the prism being repeatedly removed and replaced. When this could be readily accomplished the same was repeated for gradually more remote objects until no difficulty was experienced in securing a single image of any object in the room. The prisms were then taken home, and several times a day used in the same manner for two or three days. In the group of cases under consideration, which I have denominated as relative insufficiencies of the interni, it will usually be found that the annoyance from the indistinct distant vision has disappeared. If not, the exercise should be continued, possibly with stronger prisms. This is essentially the same as the excellent method recently promulgated by Dr. Gould; and also by Dr. Savage in his "New Truths in Ophthalmology," under the title of "Rhythmical Exercise," the value of which is unquestionable in the class of cases under consideration.

Another method of great service, which is to be regarded as a compromise, is to combine a pair of weak prisms, two degrees or three degrees base in, for each eye, with the reading glasses. The disturbance from the relative insufficiency is often felt greatly at the reading distance, and is at once removed by this expedient. I have many times seen the dim distant vision also rapidly disappear under the use of the prismatic reading glasses. In most cases they are to be regarded as a temporary expedient, and are soon voluntarily laid aside by patients who have not reached the age of presbyopia.

In a word, they are a temporary expedient, to be used until such time as the patient has acquired a new relative range. The language of Donders is significant in this connection. "The relative range of accommodation is displaced in ametropic individuals, when they have for a long time worn correcting glasses. That of myopes, as well as for hypermetropes, gradually tends to that of emmetropia." In the use of adducting prisms we simply hasten the result which he had observed to take place gradually. His remark regarding emmetropia is equally significant. He says, "In the diminution of the range of accommodation with advancing age, even before proper presbyopia has begun, the curves of the emmetropic eye approach to those of the hypermetropic." His teaching points unmistakably to the fact that he regarded the striking difference in the direction of his curves constructed for emmetropia and ametropia as the result of the anomalous

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relation introduced by the ametropia, and that when the ametropia was reduced by glasses the curves through practice or experience gradually resumed the direction seen in emmetropia. That this resumption can be very much hastened by the use of prisms I have long observed and adopted in practice, since very early in my professional experience, basing the practice upon the principles already laid down and learned from the study of Donders's classical treatise, which was the first textbook on ophthalmology placed in my hands by my early teacher, Dr. George C. Harlan.

The rapidity with which this is accomplished in some instances is quite striking, especially in young subjects. The following example will serve to illustrate: J. H., a civil engineer, aged 27, had a total hypermetropia, 2.50 D. He received 2.25 D. for constant wear, but returned as soon as the mydriatic had disappeared, complaining that he could not see distant objects. $V = \frac{6}{\text{xxiv}}$ with his glass; and he had exophoria of two degrees at 6 metres, and twelve degrees at .33 metre. Abduction ten degrees; adduction fifteen degrees. A pair of eight-degree prisms were placed before his eyes base out, which, after a brief struggle, he was able to overcome. He sat in the office a few moments with them, and was instructed to frequently remove and replace them until he had no difficulty in fusing the double images. He was then dismissed, and requested to return in two days. It was then found that $V = \frac{6}{\text{vi}}$, there was no exophoria for 6 metres, and only five degrees at the reading distance. Abduction had fallen to eight degrees, while adduction had risen to twenty-four degrees. Two weeks later the conditions remained the same, and he had no difficulty in wearing his glasses, and his asthenopia had disappeared. Such rapid relief is not the rule, but that his annoyance was due to the muscular anomaly was demonstrated not only by the result reached, but by the fact that when he first came complaining that his glasses did not suit, a pair of three-degree prisms, base in, gave him $V = \frac{6}{\text{vi}}$, instead of $\frac{6}{\text{xxiv}}$, after wearing them a few moments. The same result was reached by a weak concave glass placed before his correcting spectacles.

Up to this point I have steadily pursued the well-known teaching of the great master. As we study his classical work, his calm confidence and ample and precise demonstration lead the student forward without resistance or comment. The whole subject seems so brightly illuminated by his genius that to the willing pupil it is difficult to realize that any unexplored region had escaped the great teacher's scrutiny.

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Only once in treating this phase of the subject does he give any intimation that unexplained difficulties lie beyond his admirable demonstrations. On page 115 of the New Sydenham edition of the "Anomalies of Refraction and Accommodation of the Eye," he says, "*It is not in every one that we can satisfactorily determine the range of accommodation corresponding to different degrees of convergence. For this purpose two freely movable, accurately seeing eyes of nearly equal refraction and equal accommodating power, are in the first place required, and in addition some talent for observation.*"

This sentence is pregnant with meaning. Reading between the lines we see that the demonstrations given were true, after all is said, only for certain classical conditions,—*e.g.*, for two emmetropic eyes with normal range of accommodation, or in the case of ametropia, only when the existing defect was essentially equal in each eye. When these simple conditions obtained, the relative region and range of accommodation and convergence were displaced, as compared to emmetropia, in one direction for hypermetropia, and in the other for myopia, but no satisfactory determination was possible in other conditions,—*e.g.*, in anisometropia, in astigmatism of varying degree between the two eyes, when the acuity of vision was unequal, or in eyes where the muscular movements were for any reason disturbed.

If I may be allowed to borrow an illustration from another science, it is, in the demonstrations for ametropia as given by him, as though a beautifnl symphony were played upon a well-tuned instrument, but an octave higher or lower than the written music, the harmony being preserved; while in the other, the excluded group, the instrument is out of tune and the prevailing discords give only a jangle of discordant sounds. Thus, in the group of simple anomalies already discussed certain well-known laws determine their occurrence and point out the method of diagnosis and a logical means of relief. But what of those discordant conditions which, although under the operation of the same law, cannot in the very nature of the case pursue the same regular, albeit anomalous, course?

That these irregular defects in the form of the eyeball introduce serious disturbance of function I need not be at pains to demonstrate, since the routine of professional work is constantly bringing examples to our notice. I am, however, careful to urge the importance of different grades of error in the two eyes as especially significant from the stand-point of the anomalies of ocular balance. Anisometropia, astigmatism of varying degree or with asymmetrical meridians are conditions especially liable to introduce disturbance of binocular vision. A striking demonstration of this is found in strabismus. Two classes of eyes develop this affection,—those with very high grades of hyperme-

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tropia, and those having comparatively low grades but of different degree in the two eyes, or with astigmatism in one and simple hypermetropia in the other, or with high astigmatism in one and lower in the other, or, it may be, with an asymmetrical meridian on the side of the habitually converging eye. I have been at pains to demonstrate this by the analysis of the strabismus cases coming under my own care. In the first group, those with high hypermetropia, the error of refraction is too great to come within the relative range of accommodation and convergence, which it is possible for the individual to acquire, and binocular single vision is, therefore, impossible. In the second group, the impossibility of enjoying a sharp image in each eye at a common far point, introduces a discordant element in the struggle for binocular vision, to overcome which, irregular muscular contractions result which fall most heavily upon the eye with the greatest error, and either strabismus results from the struggle to be free from the annoying blurred image, or certain other spasmodic and utterly anomalous muscular contractions take place which have been denominated heterophoria by Dr. Stevens, although he does not recognize any relation between the ametropia and the heterophoria.

The very great frequency with which these muscular anomalies present themselves in asthenopic eyes surprised me greatly when I first came to search for them systematically in patients presenting themselves the first time for treatment. Careful investigation with proper apparatus will unveil them in a very large percentage of patients with severe asthenopia; indeed, in almost all the cases where the acuity of vision is more reduced in one eye by the character of the existing error of refraction. For such persons heterophoria is the rule. The truth of this proposition was made manifest from a study of 100 cases of heterophoria. Almost without exception the existing defect of refraction was of such a nature as necessarily to disturb one eye more than the other.

At this point it is interesting to note that two widely differing claims are made by different writers. Thus, Dr. Roosa has urged that muscular defects as such have no independent existence: that all that is required is to correct the anomaly of refraction, and the asthenopia disappears. On the other hand, it has been urged that the correction of the muscular anomaly removes the asthenopia and relieves the patient from the incubus of a pair of glasses; Dr. Stevens going so far as to assert that there is not the remotest relation, even in strabismus convergence, between it and the existing error of refraction. Any careful study of the subject in its physiological or clinical features, however, must show that truth does not languish as a prisoner in either of these opposing camps.

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Having in view the claims of Dr. Stevens, it occurred to me to inquire why, if this were true, had the careful correction of the existing refraction defect in many hundreds of persons been so generally successful in relieving the asthenopia? Or why, after careful correction, did a large group of patients remain asthenopic?

Willing to know the truth, even should it condemn the former practice, or consign to the well-filled historical dust-bins the theories upon which it had been based, I patiently pursued a new and more thorough study. I was not a little surprised at the result. Heterophoria in my first entries of new patients was unquestionably the rule. Esophoria, exophoria, hyperphoria, anomalies of the oblique muscles complicated the clinical records on every page. Fortunately, I was not willing to abandon methods which had certainly served so well in alleviating the tortures which many asthenopic patients suffer. The mydriatic corrections were still patiently pursued as before, but the patients were not dismissed until the ocular balance was once more sought under complete paralysis of the accommodation. and with the full optical correction at 6 metres, and again after the recovery of the accommodation, and glasses had been worn a few weeks or months. The lessons soon taught were of great importance and interest in this discussion. The defective muscular balance had, in the majority of the cases, vanished, either with the use of the mydriatic, and of the glasses alone, or with a few days' training of the ocular muscles. In a word, the truth contained in the law, as laid down in the classical studies of the great master, held good, even amid the discords of anisometropia and astigmatisms in all varieties. Even in these, his superb demonstration of the relative range of accommodation and convergence was true. *The path which it was my plain and simple duty to pursue was, therefore, to reduce the congenital anomalies of refraction and the contingent disturbance of accommodation to the optical basis of the emmetropic eye.* This once accurately done, and the contingent muscular anomalies, doubtless a seriously disturbing factor in all of these cases, vanished in due time under the harmonious relations established by the correcting glasses. In this connection I cannot insist too strongly upon the importance of rigidly accurate measurement and correction of the errors which may be present.

The whole purpose may be defeated by carelessness in this respect, —*e.g.*, in the placing of a cylinder axis out of parallelism with the proper meridians of the cornea in astigmatism, or in the failure to determine accurately the static refraction of each eye. A wrongly-placed cylinder axis will often, if not invariably, cause an apparent anomaly of the oblique muscles.

I could at this point cite numerous examples from my case-books

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where annoying muscular anomalies of all varieties, usually present in low degree, but especially affecting the vertical and oblique muscles, have promptly disappeared, and with them the asthenopia, when the axis of a correcting cylinder was at last correctly placed. Minor degrees of esophoria, so-called, are very likely to be produced if, for example, the hypermetropia is undercorrected on one side. The most painstaking corrections are, therefore, essential in all cases where muscular anomalies have been shown to exist before correction is undertaken. This can be successfully done in these irritable and weary eyes, with their turgid choroids and hyperemic conjunctivæ, only after the more or less prolonged use of one of the stronger mydriatics. Haste in this respect is an enemy to success. In these patients manifest corrections are of no avail, and haste in the use of a mydriatic is but little if any better. I am convinced that much of the difficulty we have experienced of late years is due to the imperfect paralysis secured by homatropine and by the incomplete employment of the stronger drugs. Manifest corrections are more reliable than those made when the eye is but partially under the cycloplegic influence of the mydriatic. I have had many demonstrations of the truth of this statement in my own practice in patients whom I had corrected under homatropine during the time that I supposed this drug was sufficient in all cases. Their failure to secure comfort led in many cases to a recorrection in the subsequent years, when a stronger cycloplegic served to demonstrate the mistakes made in the former measurements where the eyes had been subject to marked retino-choroidal irritation. This must be removed before we can hope to secure accurate corrections, and time is often necessary to this end. This the more persistent mydriatic secures. Atropine was, therefore, not an unmixed evil, or the more evanescent drugs like homatropine or duboisine an unmixed blessing. The many days required to recover from the paralysis of the accommodation occasioned by atropine or hyoscyamine is an important factor in the treatment of asthenopia, particularly where an anomaly of ocular balance is present, provided always that the full correcting glasses are prescribed at once and worn steadily during the days required for the return of the accommodation. The slow recovery allows time and opportunity for the patient to acquire a new relative range of accommodation and convergence, made necessary by his correcting glasses,—in other words, opportunity is afforded for adaptation to a new order of things introduced by the glasses. The lesson of binocular vision is learned anew, —that is to say, how to accommodate and how to converge through the glasses as control over the ciliary muscle is gradually regained. I believe it to be a mistake, therefore, to wait until the effect of the mydriatic has disappeared and then give a manifest correction. This

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is only a compromise with the relative range of accommodation and convergence, which it is more scientific to re-establish on new lines by the methods already pointed out; and, moreover, the full corrections are in cases of heterophoria often absolutely essential for their relief.

For the group of relative insufficiencies this is both important and valuable, but in the group which remains to be considered, both the treatment by mydriatics and the harmonizing influence of the most careful corrections are resisted, and we are driven to other means for their relief.

Absolute Insufficiencies.—Did the abnormalities of ocular balance present at the first examination disappear in all cases under the careful correction of refraction errors and muscular training? Unfortunately, they did not. Excluding the large group unquestionably of pathological origin, there still remained a considerable number of patients over whose symptoms or local conditions these measures had but little if any control. To this group I have applied the designation of *absolute insufficiencies.*

There is a considerable number of patients with high grades of apparent insufficiency of the interni or externi, as shown by the cover test, or vertical diplopia, or the Maddox rod, who never recognize the occurrence of diplopia, enjoy binocular vision, but suffer bitterly from their asthenopia. Notwithstanding the most careful reduction of their refraction errors, the actual strength of the antagonizing muscles, as shown by adducting and abducting prisms, do not sustain the proper ratio. In so-called exophoria, for example, the adduction may be but ten or fifteen degrees, while the abducting power is equal or even higher. In esophoria, so-called, the abduction may be but three or four degrees, and adduction twenty-four to forty degrees. Under systematic exercise I have again and again been able to teach these patients to acquire an adducting power of forty or even sixty degrees, without any relief of their symptoms and no change in their ability to resist the exophoria when dissimilar images were thrown upon the retinæ or under the cover test. In a word, although the ability to exercise adducting power under artificial conditions has been increased, there has been no improvement in the ocular balance. They have been taught how to use the faulty muscles (interni) voluntarily, but the instant the mental attention is called away the faulty balance is restored. The following case will serve to illustrate this:

Miss W., aged 22, consulted me for relief from fronto-occipital headache and weak eyes. She could not remember when she had been free from pain, which was variable in intensity, often culminating in violent attacks of migraine, which would drive her to bed in a dark room. These attacks would occasionally come without obvious cause,

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but could usually be traced to extraordinary use of the eyes or exposure to light or the movements of a concourse of people.

She had hyperopic astigmatism in both eyes, but slightly higher on the right side, the axis of the correcting cylinder being required at sixty degrees, whereas it was ninety degrees on the other side. The meridians of the cornea were therefore asymmetrical. She had been repeatedly corrected by different advisers, but without relief. The family physician and many special consultants had done everything to uncover and remove all foreign reflexes which might be the cause of her suffering. Her refraction error was once more carefully sought under prolonged paralysis of the accommodation, and totally corrected. Under cover for distance of 30 metres there was a high grade of exophoria, which carefully measured with prisms proved to be ten degrees, which was confirmed by other methods. At .33 metre the insufficiency was eighteen degrees. At 6 metres the adduction was twelve degrees, while the abduction was fourteen degrees. After a few weeks of exercise with adducting prisms, the possible adduction rose to forty-eight degrees, the abduction remaining at fourteen degrees, but the abnormal ocular balance remained the same, and she experienced no relief from her symptoms. A double tenotomy of the externi was then cautiously made with immediate relief from the asthenopia, and great improvement in the general health, which before had been precarious, because of the frequent attacks of migraine. This case is presented as illustrative of a group of patients, who under a little training acquire a voluntary control over the extra-ocular muscles, but experience no change in the abnormal ocular balance. It is probable that the anomaly is due to some faulty attachment of the ocular muscle to the sclera. It may be that the externi are attached too far forward, or that the interni are relatively too far back. Whatever the cause may have been, this case belongs to a group I have called absolute insufficiency of the interni, in contradistinction to the group of relative insufficiencies. In my hands nothing short of operative interference has furnished the slightest promise of relief. Glasses are helpful in correcting any existing error of refraction, but the anomaly of ocular balance is of essentially different nature from the first group considered. In some instances, therefore, no effect over the habitual ocular balance follows the most assiduous training, notwithstanding the fact that a great increase of voluntary adduction may be acquired. In others no amount of training increases the power of adduction or abduction. In these I have thought that the anomalous condition might be the result of some disease of the muscle, long since well, from which the muscle or its tendon had suffered a permanent impairment of function. In still others that some congenital defect in the tissue of the muscle, or some anomaly in its origin

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or attachment, which would change its mechanical relations to the ball and its antagonists, might account for the faulty conditions. In a number of these cases I have observed very marked distortions of the skull, and a great difference in size and form of the orbits, and also high grades of asymmetrical astigmatism, etc. If in these cases the antagonist of the faulty muscle does not exhibit a dynamic force in excess of its normal power, the rational procedure, if any is to be adopted, is the advancement or resection of the weak rather than the tenotomy of the relatively but not actually too strong muscle.

In esophoria I have very rarely been able to increase the power of abduction by any method of exercise or training. In a few instances, however, marked improvement has followed.

It is not very unusual to find patients who enjoy binocular vision, but in moments of repose have either a converging squint or an outward deviation. It is to this group that the terms devised by Dr. Stevens are especially applicable. In those heretofore considered at no time do we detect any deviation of the visual axes except through the agency of some artificial device. But in the group now under consideration there is an ever-present tendency to a deviation from parallelism of the visual axes. It may be in a horizontal or vertical plane or a combination of both. To these the terms exophoria, esophoria, or hyperphoria are especially suitable. During the visual act parallelism is maintained, but only at the expense of constant muscular tension. When off guard the deviation occurs, and in some cases is allowed to take place to secure relief from the sense of strain. In illustration, I recall the case of a young lady who had been my patient for eight years. I had failed to relieve her asthenopia. She suffered from frequently occurring attacks of headache, which she ascribed to her eyes. Styes, blepharitis, conjunctival hyperemia, and retino-choroidal irritation were more or less constantly present. At 10 years of age I had corrected a compound hypermetropic astigmatism, and she was unable to do without her glasses, but was not comfortable with them. The refraction, however, increased, and finally developed into myopic astigmatism, while under observation, the change having taken place through the turnstile of astigmatism, the eyes at no time becoming emmetropic. At one of her late visits I turned suddenly towards her, and to my surprise found one eye turned towards the nose,—a well-marked convergent strabismus. I expressed to her my surprise, whereupon she said, "Oh, I often do that to rest my eyes." She then related that about the time I had first seen her as a patient her father had discovered the convergence at the breakfast table, and threatened to punish her if he ever caught her "squinting" again. I had just corrected a converging strabismus in an older brother's eyes, and the father did not relish

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another siege of tenotomies in the family, and so adopted this method to avoid it. The child was taught, by his severity apparently, the ability to prevent the deviation, but at the expense of semi-invalidism for eight years. So completely could she control it that my utmost endeavor to discover the cause of her protracted trouble had failed to uncover the defect. The most I could at any time discover was an incongruity in the muscular movements. The high degree of esophoria, which could be readily measured when she allowed the convergence to take place, was now corrected by a tenotomy of both internal rectus muscles at different sittings. Her asthenopia was speedily relieved, and the general invalidism at once vanished. A large number of more or less similar experiences might be related. A point of great interest is that, notwithstanding the long years of voluntary exercise of the externi, they had not developed sufficient strength to successfully antagonize the interni. Before the tenotomies she had an abducting power of six degrees, but adduction was upwards of forty. After the tenotomies the adduction was twenty-four, and the abduction rose to eight degrees.

An interesting fact in the symptomatology of heterophoria was presented in this patient. After the tenotomies she was enthusiastic over the relief she experienced, and voluntarily related that for the first time within her recollection she found it possible to enjoy complete repose. She had always found it necessary to keep some group of muscles, usually of one of the lower extremities, in a state of tension, and would rise in the morning even, with one limb sore and tired as a consequence of the muscles having been maintained in this state during sleep, which was invariably disturbed and restless. This disappeared at once, and has not returned. Her sleep became quiet and restful, her general health improved, she gained in weight, and used her eyes with impunity. In a word, she was at once removed from a most discouraging state of semi-invalidism.

There is therefore a group of patients suffering from abnormalities of ocular balance who, notwithstanding the most rigid and accurate correction of refraction errors, after the most persistent and painstaking training of the relatively weak muscles, get no relief from compromise or conservative methods of treatment, and still remain to torment us over the failure of our art. They wander from one consulting room to another and back again in search of some hoped-for relief. We send them on journeys in the hope that a foreign confrère may be more successful. But they return, and after a siege with rest treatment or gynecological exploits, etc., return to the original belief that it must be their eyes, and so they are back again,—the ghost will not down. They are neurotics in many instances, I grant, but they are invalids because a

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delicately poised nervous system will not bear the tribulation of an ever present muscular tension such as is present in the malady under discussion. No class of eye patients repay careful study and proper treatment more than these.

Careless methods or rude appliances, however, are not sufficient for their study.

Accurate diagnosis is of first importance, and this cannot in a large number of these patients be reached with the rudely-fitting and cumbersome trial frame and the series of prisms usually found in the box of test-glasses. In the first place, such appliances add to the fatigue and nervousness of an already nervous patient, and, furthermore, do not insure accuracy for the reason that it is impossible to maintain a strictly horizontal or vertical position of the frames. It is easy in this way to produce a considerable degree of hyperphoria when strong horizontal prisms are placed in the frames. Some fixed form of apparatus is therefore desirable, and an accurately-adjusted pair of rotary prisms so arranged that they can be conveniently placed before the eyes. All defects of refraction should be excluded by correcting glasses carefully centred, and the measurements of the ocular balance made through them. They should be accurately centred for six metres.

There is a considerable number of these patients with anomalies of ocular balance who experience very great and often complete relief from wearing prisms so placed as to favor the faulty muscle.

As an illustration of their great value I recall the case of a gentleman whom I saw first in 1874, and who had been a life-long sufferer from violent migraine, which frequently drove him to bed with violent explosions of pain. Never comfortable, he, nevertheless, was able after these severe outbreaks to get on with comparative ease for a few days, but the suffering would gradually increase until the culmination in another violent explosion, which rendered him utterly helpless. He had a low grade of myopic astigmatism in each eye, the axis of the correcting cylinder being required at ninety degrees on one side and at one hundred and eighty degrees on the other. These gave partial relief, but not until a right hyperphoria of two degrees was discovered and a correcting prism combined with his glasses did he escape the attacks of migraine. This prism, added also to the succeeding changes in his reading glasses, has been worn since 1874 with complete relief. This case is a fair representative of a very large group I have seen since, where the prisms have been placed horizontally or vertically.

On the other hand, in many apparently similar cases the prisms have not only failed to afford relief, but have actually aggravated the symptoms. It is in these that tenotomy seems the only source of relief, and is so beneficial when wisely chosen and skilfully performed. No

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class of patients have probably been more neglected or worse treated than these; but in no other have I experienced more satisfactory results or more dismal failures. As experience in their study, classification, and treatment widens, however, I am happy to record that the failures grow less frequent. No class of patients are so grateful for relief as these victims of abnormalities of ocular balance, and this whether the relief has come through the conservative methods applicable to the group of relative insufficiencies or by operative interference in those with absolute anomalies of balance.

Operative interference should be undertaken with great caution. Such remark is quite unnecessary to any surgeon who has studied carefully the anatomy and physiology of the complex system by which the ocular movements are effected. Any disturbance of the relations of parts in this delicately-poised apparatus should demand the courage born only of knowledge. The extensive laceration of the tissues so often practised in strabismus is never admissible in the group of patients considered in this discussion. It would be well to adopt the aphorism that no operation is justifiable which cripples the motility of the eye. Any extensive laceration is sure to do this. Broad divisions of the conjunctiva and capsule of Tenon, followed by a separation of the tendon from the sclera, are followed by a gluing together of all these structures into a solid mass, which it is impossible to differentiate in any subsequent operation, as I have had many opportunities to observe.

The profession is greatly indebted to Dr. Stevens for the technique of tenotomy which he has taught us, even if we are not prepared to receive his teaching in many other respects. If his methods are skilfully followed, there is but little if any injury to the parts involved. I have long practised the method he has described, even in strabismus. The tissues should one after the other be carefully taken up and separately divided. A small snip in the conjunctiva, as nearly as possible over the insertion of the tendon, should first be made, being careful not to include the subconjunctival tissue in the grasp of the forceps. The conjunctiva should then for a small area be freed from the underlying membrane. The fibres which envelop the tendon should then be lightly grasped and carefully cut, so as to expose the insertion of the tendon, and then separated from the anterior surface of the tendon to an extent commensurate with the degree of recession of the tendon required. The tendon should then be grasped a few millimetres back of its insertion, lifted up, and divided at its exact centre. The opening thus made can then be enlarged by successive snips of the scissors on either side of the central opening until the entire tendon is separated from its scleral insertion, but without lateral division of the capsule. While the severed tendon is still in the grasp of the forceps, it should

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then, with due regard to the result desired, be cautiously separated from its attachments to the sclera on its posterior surface. In performing these various steps great care should be exercised to keep the field of operation free from blood, so that the parts shall not be obscured, as there should be no uncertainty in the manœuvre.

If the tendon of the muscle has been carefully separated from the overlying capsule, and also from the fibres which bind it to the sclera back of its insertion, it will be seen to retract as soon as released from the forceps, the extent of the retraction depending upon the extent to which it has been freed from the capsule. The after management is important. The operation is almost a subconjunctival one, and, therefore, does not demand the protection usually accorded to strabismus operations where extensive lacerations have been practised. Moreover, the purpose of the operation is materially aided by allowing the eyes to remain open and in use for ordinary purposes before the divided muscle is securely fastened in its new position. While the adhesions are still plastic the eyes have an opportunity to balance themselves, certainly if too little has been done, by stretching of the plastic adhesions. If the adjustment at the end of an hour is perfect the bandage should be applied for a few hours and then removed at home and the correcting glasses worn, but no work at a near point undertaken. If the primary result is slightly excessive the bandage should be worn until the following day, and if the anomaly is over-corrected a stitch should be inserted through the centre of the tendon and episcleral tissue in front of its original insertion and gently drawn forward to any desired degree and fastened, supporting it for a day with a bandage.

If the excessive retraction occurs in the case of the internus a slight excess may safely be neglected, but the case is different with the externus or one of the vertically-acting muscles. In these no excess should be allowed to remain after twelve or twenty-four hours. I have the patient remain in the office for an hour with the eyes open, and then measure the result and send him home with a light bandage, to be removed or not as suggested by the results of the measurement. When there is any uncertainty as to the muscle actually at fault, or as to whether the fault is a temporary cramp, I have often stretched the muscle by grasping it with the forceps well back of its insertion and steadily but firmly placing it upon the stretch, and holding it for several seconds. This will often break up, *e.g.*, an apparent hyperphoria, and in twelve hours the case reveals itself as a relative insufficiency of the interni. I have a conviction that the results which follow partial tenotomies are to be ascribed to the stretching of the muscle in some cases.

Regarding so-called insufficiencies of the oblique muscles, so urgently pointed out and so frequently found by Dr. Savage, of Tenn-

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essee, I wish to say that I am not ready to accept his claim, believing as I do that the phenomena he witnesses have been wrongly interpreted, except in extremely rare cases.

When determined by his method at the reading distance with or without glasses, he simply demonstrates a physiological law of ocular movements. Many of the cases reported as cured by exercise with cylinders are explicable on other and totally different grounds. Then, too, his reports are not sufficiently full regarding the points made in this paper as to the relative range of accommodation and convergence to satisfy the exacting clinician.

Since a relative insufficiency of the interni must of necessity be present in a large group of patients receiving convex glasses for the correction of hypermetropic refraction, it follows that we should anticipate, for a time, more or less irregular movements of the eyes before a complete readjustment to the new relations can take place. These irregularities can be detected if our methods of search are sufficiently accurate and painstaking. This is particularly true if the correction is faulty and the eyes irritable. I can readily believe that one might find hundreds of cases of so-called cyclophoria particularly, if sought for at the reading distance. If a patient is not comfortable with the cylinder axes placed respectively at 100 degrees and at eighty degrees, but his trouble is removed by changing their direction, it is much more rational to conclude that they were not correctly placed in the first instance—that is to say, were not parallel to a principal meridian of the cornea—than to ascribe his discomfort to an insufficiency of the oblique muscles.

Nothing is more common, even after the use of hyoscyamine or atropine, than to find the axes of the cylinders chosen at ninety degrees, and, after twenty-four hours, be compelled to place them at seventy-five degrees and 105 degrees, respectively or *vice versa*. The surgeon who contents himself, therefore, with corrections made in a single morning, however carefully or frequently he may instil the homatropine, or however strong solution he may use—with or without cocaine—will, in spite of the aid of the ophthalmometre or skiascopy, frequently place the axes of the cylinders in erroneous positions. While I see no reason to doubt the probability of anomalies of the oblique muscles occurring, I do not believe that they are so frequent that any surgeon will see large numbers of them in a single year.

I have repeatedly seen hyperphoria of one degree or two degrees disappear as soon as the faulty direction of a cylinder axis was corrected, and still more frequently after a relative insufficiency of the interni had been overcome by prism practice.

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CANCER OF THE STOMACH WITH VERY RAPID COURSE.

By William Osler, M.D.,

Professor of Medicine, Johns Hopkins University.

The diagnosis of cancer of the stomach may be obscured by many causes, among which perhaps the least frequent are variations in the duration of the disease. The disease rarely lasts more than two or three years; a duration indeed of three years is most exceptional, while a rapid course—three months or less—is still more uncommon, even in young persons, in whom, as Mathieu (quoted by Welch) points out, the progress of the disease is often rapid.

I have had under observation two cases only in which the course of the disease was remarkably rapid. In one of these, reported by Dr. Thayer,[1] the entire duration from the onset of the symptoms (the patient being a strong, well-developed man, aged 40) was under six weeks. With the exception of occasional bilious attacks he had always enjoyed good health. The chief symptom was incessant vomiting. At the post-mortem there was found an infiltrating, not ulcerated, cancer at the pylorus, without dilatation of the organ. In this case the fatal result was not due primarily to the cancer, which was not larger than a walnut, but to the vomiting excited by its presence.

In the following instance the acute symptoms developed in a man who had had dyspepsia for years, and who had been for eighteen months a martyr to vertigo of the type of Menière's disease. The case presents several features of special interest:

(1) The complete relief of agonizing vertigo by the correction of refraction errors.

(2) The onset of acute symptoms (uncontrollable vomiting) and death within two weeks, without any previous aggravation of the existing dyspepsia or serious loss in weight.

(3) Vomitus of an extremely offensive (almost fecal) odor, due to sloughing of the cancer.

Dyspepsia for many years; for Eighteen Months Attacks of Vertigo of Great Severity; Complete Relief by Correction of Refraction Errors; Sudden Onset of Severe Gastric Symptoms and Death within Two Weeks; Diffuse Infiltrating Carcinoma of the Stomach with Sloughing. —A. B., aged 54, seen April 4, complaining of vertigo and of stomach trouble.

The family history is good; there are no similar affections that he knows of in any of his near relatives.

[1] Johns Hopkins Hospital Bulletin, Vol. II.

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The patient is a brick-maker by occupation. His habits have been good. He has been a steady smoker until about a month ago.

The patient was well and strong as a young man, and has throughout life enjoyed tolerably good health, though for many years he has had dyspepsia, but never very badly until within the past eighteen months. Two years ago he had an attack of biliary colic severe enough to require hypodermic injections of morphia. Four months afterwards he had a second attack, with great pain in the right side. After this the skin was a little yellow. He has had no attacks since of a similar character. For about eighteen months he has had attacks of severe vertigo associated with flatulency. The first one occurred while he was sitting at the table in a restaurant drinking claret-punch. He jumped up and said to his wife, "Catch me, catch me," and had to get hold of the table to steady himself. He had a sensation as if a cannon-ball had burst in his head, and as if everything was in motion. The attack lasted about an hour. He did not vomit, but looked pale, and broke out into a profuse perspiration. He has had only two attacks of similar severity, one while in his carriage. He said it seemed as if the horse was down and everything was turning over. This attack lasted about an hour. He had to go to bed and felt very badly, and after it he was all confused in his head.

The milder attacks have occurred with great frequency. Scarcely a day passes without one or two; thus, yesterday after breakfast his stomach felt badly and he had a good deal of belching. Then, as he expresses it, his head went off at once, and he generally cries to his wife, "Come and catch me." Coming home just before dinner he had another spell. When they are at all severe he gets pale and cool, and perspiration rolls off his face in beads. He belches all the time during an attack, and on some days he belches continually. He has no pain whatever in the chest or elsewhere. The attacks do not come on during sleep, but he has had several of them while in bed.

From his statement the vertigo apparently is both subjective and objective. Objects go to the right, but he feels that he turns also. In the attacks it is impossible for him to walk. It appears to him that one foot goes about ten feet higher than the other. If the head is held tight the attacks do not appear to be so severe. He has never lost consciousness, though he sometimes feels faint. There is no throbbing at the heart. The longest interval he has ever passed without an attack is two weeks.

He lays the greatest stress upon the condition of the stomach, and says that everything comes from it, and that the belching is incessant and most distressing.

Though he did not complain of difficult hearing, it was evident

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that he was a little deaf, and on questioning him he stated that deafness had been coming on for several years past, particularly in the right ear, in which there is a singing noise almost constantly. In the spells it is much louder, and sometimes there is the explosive burst already spoken of. He thinks he is never without the noise in the ear.

Present Condition.—A small-framed man, a little pale, with feeble musculature. He belches loudly at intervals. The pulse is 76. No special sclerosis of the arteries. Apex-beat not visible, not palpable. No increase in area of dulness. The second sound is very ringing and accentuated at the base. There is a soft systolic murmur at the aortic area. No diastolic murmur audible. The liver is not enlarged. No tenderness on palpation at costal margin. The stomach is moderately distended. Tympany extends from fifth rib to three finger-breadths above the navel. Spleen not palpable. Hearing is much impaired on right side. He says he has been deaf in this ear for seven or eight years. He can hear the watch in close contact. In the left ear can hear it at a distance of six inches.

Dr. Theobald, to whom I referred the patient for examination of the ears, wrote that there was deafness in the right ear, due to changes in the auditory nerve or its expansion in the labyrinth, and that there was also slight deafness in the left ear. The examination of the eyes showed a rather high grade of hypermetropia, with a decided amount of astigmatism, which he thought would be materially benefited by glasses, as the error of refraction was possibly an important factor in causing the attacks, though the condition of the ears was such that it was reasonable to suppose that they also might have something to do with it. The change in the patient from the use of the properly-adjusted glasses was most remarkable. He came to see me again towards the end of May, and said that he was living a new life; that not only had he had no severe attack, but that the milder attacks had disappeared completely. His stomach still troubled him, but he said was not nearly as bad as it had been.

I did not see this patient again until June 29 (with Dr. Benzinger). His stomach had been worrying him for some weeks, though he had kept about and had been transacting his business as usual until June 22. On that day he began to have vomiting, and could not retain anything on the stomach. Since then he has not been able to take anything into his stomach without aggravating the vomiting. In the intervals between the attacks he is comfortable, has no pain, and the only distress is just prior to and during the attacks, which recur every three or four hours. The material vomited was at first watery, grayish in color, and not bloody.

To-day when I saw him his condition was as follows: He looked

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very much as he did in April; perhaps a little thinner. The color of the lips is good. There is no fever. The tongue is moist, and has a slight fur. He belches at intervals. The material vomited to-day was reddish-brown in color, and contained flakes of blood, and on settling it had a distinct coffee-ground sediment. The abdomen was not distended and was nowhere painful. Nothing could be felt in the region of the stomach; there was evidently no dilatation.

I thought from the acute onset and severity that it might possibly be a severe gastric crisis in connection with his labyrinthine disease. I did not see him on the 30th.

July 1. The condition of the patient is unchanged. About every two or three hours he vomits from six to eight ounces of a thin fluid, blood-stained and highly offensive, and which contains also fragments of blood clot, and sometimes shreds of necrotic tissue. All the usual remedies have been tried to allay the vomiting without any avail, and even if he takes a little water it is thrown off at once. He has been fed by the bowel, and given large injections of brandy and water. Apart from the vomiting spells he says he is very comfortable and has no pain. The examination of the epigastrium is negative. The recti are somewhat resistant, but there is not the slightest distention, and no pain on deep pressure.

On Monday and Tuesday the vomiting continued, and he grew weaker, but even now he did not look very badly, and the pulse kept up wonderfully. He retained the injections very well. The odor of the vomitus had become, if possible, worse, and now appeared to have a distinctly fecal smell; the character of it remained about the same, a thin reddish-brown fluid, with a coffee-ground sediment. The odor was such that we suspected perforation into the bowel. It was remarkable how much he brought up from the stomach in the twenty-four hours, at least two pints, yet for more than a week he had taken nothing into his stomach.

The examination of the fluid showed that it was acid, reacted feebly for free hydrochloric acid, contained red blood-corpuscles, granular *débris*, but no formed elements. On Tuesday evening at 9.20 I examined the material which had been vomited at 8.40 P.M. It was extremely foul, with a distinctly fecal odor. Nothing characteristic was found in the fragments of blood clot or in the sediment. A cercomonas was seen. The pipette which I used to remove the fluid had been standing in a jar of water, but I had, as a precautionary measure, drawn alcohol into it before using.

On Wednesday, July 4, the condition of the patient remained much the same, but he became weaker after each vomiting spell. In the evening it was evident that he was failing very rapidly, and he

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had not the strength to vomit. He sank and died on the morning of the 5th.

Autopsy, by Dr. L. F. Barker.—Only the abdomen was examined. The peritoneal cavity contained the preserving fluid of the undertaker.

The greater curvature of the stomach and a small portion of its anterior wall were alone visible, the rest of the organ being covered by the left lobe of the liver. On lifting this the stomach had a grayish-red appearance, was small, and the walls looked infiltrated. Neither the transverse colon nor any coil of the small bowel was adherent. The organ was opened *in situ*. There was some bloody fluid in the cavity, of the same nature as that which he had vomited. The body of the organ was the seat of a diffuse infiltrated carcinoma. In the lesser curvature and the posterior wall in an area nearly the size of the palm of the hand sloughing had taken place. There was a large, flat, ulcerated surface to which shreds of necrotic tissue were adherent. The index finger could be passed into the pyloric orifice; the cardiac orifice was free. There was no perforation. The liver was smooth, and there were no changes in the other abdominal organs.

Of course, the anatomical condition made it perfectly plain that the growth in the stomach had been of considerable duration, but it had not seriously undermined his health or strength. I rarely remember to have seen such a remarkable change in a patient as in this man after the correction of his refraction error by Dr. Theobald. As he expressed it, he was "living a new life," and when I saw him towards the end of May he looked very much better. The dyspepsia still worried him, but he no longer had the incessant belching. Yet the onset of his serious and fatal illness was within a month of this date. This form of infiltrating neoplasm disturbs in the least degree the functions of the stomach, and there are many instances of persons who have had diffuse carcinoma, whose appetite and digestion have remained good almost to the end.

From the character of the vomit and the horrible stench in this case, I fully believed that sloughing had occurred, but there was also a fecal odor of the vomitus, which led us to suspect perforation of the bowel as well. Very possibly in the persistent and long-continued vomiting there was more or less regurgitation of the contents of the intestine.

By no means the least interesting feature in the case was the entire relief of the severe vertigo by glasses.

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SUBCORTICAL GLIOMA OF THE CEREBRUM AFFECTING PRINCIPALLY THE ARM CENTRE; REMOVAL; RECURRENCE OF THE GROWTH; SECOND OPERATION; RECOVERY.[1]

By Alfred C. Wood, M.D.,

Instructor in Clinical Surgery in the University of Pennsylvania; Assistant Surgeon to the University Hospital.

For the privilege of reporting the following case I am indebted to Dr. H. C. Wood, in whose service at the University Hospital the patient first came under observation, and Dr. J. William White, to whom he was referred by Dr. Wood for surgical intervention.

Briefly, the history is as follows:[2] "W. B., aged 28 years, of Irish descent, whose occupation is that of a bar-tender, states that he has always enjoyed good health until the beginning of the present trouble. Careful inquiry failed to elicit any family predisposition which would have a bearing on the present condition. According to his account of himself, he first noticed, in August, 1892, occasional twitchings in the left hand. These have recurred at irregular intervals up to the present time, until now they sometimes happen several times a day. They begin with a tearing sensation in the hand, movement and sensory disturbances, however, coming on almost simultaneously. The arm is commonly flexed at the elbow by tonic contractions, though the hand is clonically and furiously moved. Sometimes the attacks are not attended by loss of consciousness. Usually, however, of late, the first movements are followed almost at once by unconsciousness and a fall to the ground, there being general muscular relaxation, excepting in that the mouth is commonly drawn towards the left side. On two occasions there have been violent general epileptiform convulsions. When he first came under observation there was no distinct paralysis of the arm, but a slowly progressive loss of power not yet amounting to complete paralysis has developed. There have been occasional attacks of vomiting. In the early history of the trouble he was free from headaches, but lately these have been more and more frequent and severe. The pain is located in the region of the right temple, and has been at times so severe as to preclude sleep for a whole week. There is also at present a rapidly-progressive and severe double optic neuritis, with retinal hemorrhages and large, tortuous, retinal veins. Thirteen years ago, he says, he was struck on the top of the head with steel knuckles,

[1] Read before the Philadelphia County Medical Society, 1894.

[2] Abstracted from a clinical lecture delivered at the University Hospital upon the patient by Dr. H. C. Wood, in January, 1894.

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possibly a little to the right of the middle line. The blow caused him to reel, and he was dazed for a few moments, but did not lose consciousness. No further trouble was experienced from this accident. The reflexes are normal. The urine is free from albumin and sugar, specific gravity 1033, acid in reaction. There are no disturbances of the special senses other than diplopia and some contraction of the field of vision, which latter is evidently the result of the optic neuritis. The symptoms point to the presence of an organic disease, affecting especially the motor arm centres in the cerebral cortex, and spreading upward to those of the face; possibly, also, affecting slowly the leg centres, as there seems to be some weakness of the left leg.

"I do not think it possible to make an absolutely positive diagnosis as to the nature of the organic disease, but I have no doubt from the way in which the case has progressed that there is some form of tumor present. The possibility of syphilis has been carefully considered and put to one side by a very active antispecific treatment, which failed to produce any improvement whatever. The important practical question is whether the tumor springs from the meninges or arises within the brain. Here again the diagnosis is simply one of probabilities, not certainties. It is, to my thinking, improbable that the tumor springs from the meninges. Early in the case pain was wanting, so that the headache from which he now suffers is almost certainly a pressure symptom, and not the result of any localized meningitis or meningeal irritation. In the second place, the occurrence of an optic neuritis along with a cortical lesion, situated as high up in the vault as the present must be, would indicate great increase in the brain pressure. A tumor springing from the membranes and so located that in its first inception it would evince its presence by symptoms of irritation of the cortical centres, would, I opine, of necessity have produced by pressure and secondary changes complete destruction of the cortical centres by the time it had grown sufficiently to cause the violent pressure symptoms present in this patient. I believe, therefore, that the tumor is of intracranial origin. It is probably not tubercular on account of the general good health of the patient, and it must therefore be in all probability sarcomatous or gliomatous. After a very careful consideration I have come to the conclusion to recommend surgical interference, for the following reasons: The case is progressively going from bad to worse, and must soon end in death if surgery be of no avail; second, it is possible that I may be mistaken in supposing that the tumor arises from within the brain, and if a meningeal tumor should be found, the result of surgical interference would, of course, be most brilliant; third, even if a glioma or sarcoma of the brain substance exists, it seems to me possible to remove sufficient of the mass to relieve the intense

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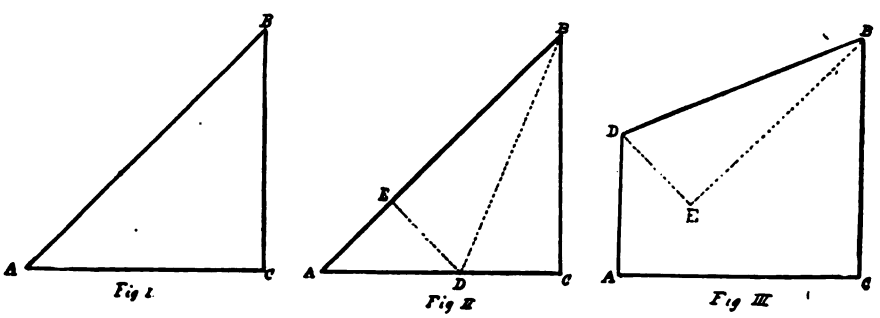
pressure symptoms, and probably to increase the comfort and protract the life of the patient. I shall, therefore, send the case to Professor White for operation.''

With such a history, in addition to the careful study already made of the case by Dr. Wood, it is needless to say that in the advisability of an operation, Dr. White was fully in accord. The consent of the patient having been readily secured, the day previous to that set for the operation the entire scalp was shaved and well scrubbed with soap and warm water, then washed with alcohol, and finally douched with a solution of bichloride of mercury 1 : 1000 and carbolic acid 1 : 50, after which the head was covered with an antiseptic dressing wrung out of a solution of corrosive sublimate 1 : 2000 and carbolic acid 1 : 100. The usual preparatory treatment for a patient about to undergo an operation of this magnitude was carefully carried out.

Operation, 1.30 P.M., January 24, 1894. After the administration of ether the cleansing of the scalp was repeated in the same manner as before. As the symptoms, detailed above, clearly pointed to implication of the arm centre of the right cerebral hemisphere, the position of the fissure of Rolando on the right side was marked upon the scalp, having been determined by the method of Mr. John Chiene, of Edinburgh, which is as follows:[1] A moderately heavy piece of paper, at least five inches square, is folded upon itself by bringing two diagonal corners into apposition, forming a triangle (*A B C*, Fig. I). The angle



A B C, being one-half of a right angle, is equal to forty-five degrees. One free margin, coinciding with *B C*, is then folded over so that it lies upon the line *A B*, forming the angle *E B D* (Fig. II), whose value is one-half of forty-five degrees, or 22.5 degrees. Now, by retaining the last fold and unfolding the first, the sum of these two angles is obtained, which equals 67.5 degrees (*D B C*, Fig. III).

As pointed out by Thane, the fissure of Rolando starts on the line from the glabella to the inion at a point 55.7 per cent. of the distance,

[1] An American Text-book of Surgery.

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measured from the former, and runs downward and forward at an angle of sixty-seven degrees for a distance of about three and one-half inches, the lower extremity of the fissure running slightly more perpendicularly than indicated by the line. For practical purposes it is sufficient to measure half an inch behind the middle point between the glabella and inion as the upper extremity of the fissure. If now the angle *B* of the folded paper, which represents sixty-seven and a half degrees, be placed at this point with the straight edge *B C* along the middle line of the head anteriorly, the folded margin of the paper (*B D*) will represent the position of the desired fissure, which stops at three and a half inches from the upper extremity. It is now well known that the convolutions at the upper end of this fissure control the movements of the opposite leg, while those at the lower extremity control the muscles of the opposite side of the face; between these the centre which governs the arm is located. Having fixed these points on the scalp with an aniline pencil, it remained to indicate their positions on the skull, which was done by forcing a fine drill through the scalp and rotating it two or three times to make an impression on the bone. A large horse-shoe-shaped flap with the base anteriorly, and consisting of all the layers of the scalp, was raised so as to expose the motor area, and the hemorrhage controlled by means of hemostatic forceps. An inch-and-a-half trephine was applied over the arm centre as indicated by the mark on the skull, and the button of bone removed. The exposed dura was of a deep-purple color and tense and bulging, but was not adherent. The opening was then enlarged above and below with the rongeur forceps, to the extent of from two to two and a half inches. Before the operation was begun it was decided to proceed after the method recommended by Mr. Horsley, which consists in making an appropriate flap and removing the necessary portion of bone. After the hemorrhage is arrested, sterilized gauze is laid in the wound and an antiseptic dressing applied; the removal of the tumor being deferred until the patient has recovered from the shock of this procedure. After the dura was exposed, however, the amount of tension indicated so high a degree of intradural pressure that it was thought advisable to proceed further. The dura was very carefully divided and turned aside. The convolutions exposed were deeply congested and bulged into the wound, showing unmistakably that the seat of trouble had been exposed. Palpation did not throw any additional light on the condition, as there did not seem to be either distinct resistance or undue softening. An incision into the most prominent portion of the swelling revealed what at first seemed to be a cyst, with a wide zone of altered brain substance surrounding it. The tissue around the cyst was dark in color, and contained a few small extravasations of blood,

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and upon closer examination was thought to be a new growth with secondary central softening, giving the appearance of a cyst. This mass was found to merge into healthy brain substance on its different aspects without any attempt whatever at encapsulation, or of sharp demarcation. The removal of this tissue was effected by the cautious use of the knife, scissors, and curette. It was impossible to remove it as a whole, on account of its soft consistence, and it was, therefore, taken away piecemeal. There was no way of judging when the tumor had been entirely eradicated, but the operation was discontinued as soon as healthy brain tissue appeared to have been reached on all sides. The cavity left in the brain was about the size of a large walnut. Bleeding-points were ligated where possible, a drainage-tube inserted, the wound packed with iodoform gauze to arrest the bleeding which still continued, the wound in the dura was closed by catgut sutures except at the point where the tube and gauze came out, the flap stitched in place with silkworm gut, and an antiseptic dressing applied. The operation was well borne, and the patient came up from the ether nicely, suffering only moderately from shock. As the effects of the anesthetic wore off it was discovered that the left side of the face was flattened and expressionless, and when voluntary motion returned it was found that there was complete paralysis of the left arm and leg. At 10.30 P.M. of the same day, motion began to return in the paralyzed leg, and by 12 o'clock, midnight, the patient was able to flex the limb and move it about. Sensation was not impaired. The course of the wound was satisfactory throughout, the iodoform gauze was removed on the second day, and the drainage-tube two days later; there was no discharge of pus at any time, and healing was prompt except at the point occupied by the tube, which closed by granulation. The paralyzed side of the face soon began to improve and went on to complete recovery. Motion in the arm began to reappear two weeks after the operation, but has made little improvement. It was soon found that the scalp overlying the trephine opening in the skull was becoming elevated. This condition increased rapidly until a tumor the size of an egg had formed, in spite of continuous firm bandaging. The swelling was at first thought to be due to what is known as fungus cerebri, but it later became apparent that it was a recurrence of the neoplasm. There were no subjective symptoms of intracranial growth.

In May, having made the same preparations as before, a flap was dissected back from the swelling, the opening in the skull enlarged, and a considerable quantity of substance, similar in character to that removed at the first operation, was taken away. The distinction between the healthy brain substance and the new growth was more pronounced, so that the removal of all of the tumor could be made more

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complete and certain. There was very free hemorrhage, which, however, yielded to pressure, the wound was closed without drainage, and the usual dressings were applied. The operation was immediately more serious than the first. There was more hemorrhage and more shock, but the patient rallied well, and was up and about again in a few days.

Since the moment of the first operation there has been absolutely no headache, no recurrence of the spasms, not even an abnormal sensation, and the vision, which was very imperfect before, now seems as good as it was previous to the beginning of the trouble. He walks about with the assistance of a cane moderately well, but he has little use of the left arm.

Microscopic examination of the tissue removed showed the appearances of a glioma.

The patient left the hospital and passed from observation until about six weeks ago, when he stated that he had been entirely free from all symptoms during the interval. He walks well without a cane, although the left leg is somewhat spastic. The functions of the arm have not improved much. Since leaving the hospital, however, there has been no attempt to improve the condition of the limbs by massage and electricity, so that failure to make greater progress towards the restoration of the muscular tone of the left arm and leg may be due in part to this neglect. There is now some increase in the knee-jerk on the left side, indicating descending degeneration in the cord. The scalp over the seat of the former operation is depressed, as is always observed in these cases if the bone has not been replaced nor substituted by a portion from another source. The part seems entirely healthy; there is no evidence of a return of the growth. The patient states that he eats well, sleeps well, and is up to his usual health and weight.

The features of especial interest in this case are,—

(1) The accurate location of the growth clinically.

(2) The precision with which the tumor was exposed by the trephine opening.

(3) The immediate and complete left-sided paralysis, followed by perfect restoration of the normal condition in the face, and the return of a very fair degree of function in the leg, while motion in the arm has failed to improve markedly, showing that the arm centre has probably been almost entirely removed, while the face and leg centres were but slightly encroached upon at the operation, and, although suffering temporarily from the traumatism, have preserved their integrity.

(4) The recurrence of the growth, followed by its successful removal; the patient remaining well until the present time, now seven months after the last operation and eleven months after the first.

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(5) The assertion of Séguin, Mills, and others that in subcortical lesions of the brain hemiparesis precedes the spasms, and which condition was noted in a case recorded by Diller and Buchanan, was not borne out, as the reverse was true in the case just reported. Myotonia, which is also said by Mills, Lloyd, and Séguin to be a symptom of a subcortical lesion, was absent.

The present position of cerebral surgery marks one of the great achievements of the healing art, and has been made possible entirely through the agency of modern aseptic technique. We do not now consider it a more serious matter to expose and explore the brain than the peritoneum. Unfortunately, the affections of the brain are not so frequently suitable for surgical attack as are those of the peritoneal cavity. However, with the seat of numerous important functions of the brain already determined, with the constantly increasing certainty with which the neurologist is able definitely to locate the exact seat of numerous pathological processes, with the ability to cut down and expose these points with precision, through a knowledge of craniocerebral topography, and with the present improved operative technique, the legitimate field of surgical interference must grow broader.

It is evident that in order successfully to remove a tumor of the brain, without taking the life of the patient, it must be situated upon or near the convexity. From a careful study of the post-mortem records of 600 cases of brain tumor, by Starr,[1] there were found forty-six in which an operation was indicated by the general and local symptoms, and in thirty-seven (6 per cent. of the total number) the conditions were such that the tumor could have been easily removed. The average proportion of brain tumors that are favorably situated for removal, as given by various authorities from a study of post-mortem records, is 7 per cent. It is especially interesting to note that in the cases analyzed by Starr the tumor could have been removed easily, and with safety to the patient, in at least 78.7 per cent. of the cases in which the symptoms pointed to a growth in an accessible region. There is no doubt, however, that the number will be much greater in the future, for the reasons already mentioned.

In regard to the mortality of these operations, the same author, from a study of the operations so far reported, finds that in a series of eighty-one cerebral tumors the growth was successfully removed fifty-four times. Of these thirty-nine patients recovered and fifteen died, the percentage of final recoveries being therefore 48.14.

Erb reports a case (quoted by Starr) which in many particulars is so similar to the one just detailed that it is here reproduced.

[1] Brain Surgery, 1893.

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The patient was a man who had suffered from the general symptoms of brain tumor—viz., headache, vertigo, vomiting, and optic neuritis—for some months. The development of occasional spasms followed by paralysis in the left arm and leg indicated the central convolutions of the right hemisphere as the probable position of the tumor. Czerny operated in November, 1890, and found the tumor to be an infiltrated glio-sarcoma, and removed a part of it, its complete extirpation being impossible. The patient recovered from the operation, was very much improved for eight months, and then began to suffer again from the old symptoms. In November, 1891, his condition had become so bad that it was thought best to repeat the operation. The tumor was found to have grown again, and again a large part of it was removed. Again improvement was very striking, but at the date of the report, July, 1892, a third operation upon this man was in contemplation, the symptoms having again appeared.

As a result of his studies, Starr states that the large majority of the gliomata and the glio-sarcomata were infiltrated into the brain substance to such an extent as either to have escaped detection at an operation, or to have been impossible of excision. When it is considered that this statement is based upon a study of 600 cases, the one here reported must be considered as having terminated unusually successfully.

The cause of these tumors is as obscure as is that of those situated upon other parts of the body. In a large number of the cases a history of traumatism will be obtained, but whether or not this has any etiological bearing it is impossible to say. The patient whose case is detailed above reports having received a blow on the head thirteen years ago. At the time of operation there was no evidence of injury either of the scalp or in the skull.

Pressure Palsy from Walking upon Stilts.

Bergonié and Bordier (*Arch. d'Électricité Médicale*, September, 1894) report a case of paralysis from pressure on the right anterior tibial nerve, just below the division of the external popliteal nerve into its anterior tibial and peroneal branches. The tibialis anticus and the extensors of the toes and the great toe were the muscles affected. The peronei had escaped. The patient lived in the marshy districts near Bordeaux, where the use of stilts is common, and walked several miles daily upon them. The stilt was buckled round the upper part of the leg by a stout leathern strap, and beneath the strap he wore a pad of leather. It was this pad which had compressed the nerve. On the left side the pad fitted better, and the nerve had escaped injury.

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SECRETION OF URINE AFTER CELIOTOMY.

By Charles B. Penrose, M.D.,

Professor of Gynecology, University of Pennsylvania.

In many operations upon the pelvic organs of women there is great danger of injuring the ureters. These structures may be included in the ligature or clamp, they may be wounded by the knife or scissors, or they may be kinked by traction on contiguous tissues, so that the flow of urine is impeded or altogether stopped. Such accidents are often, perhaps generally, not recognized at the time of the operation; but some hours or days afterwards the surgeon's attention is directed to the possibility of this accident by complete suppression of urine or by the marked diminution in the quantity.

As the proper treatment of such injuries to the ureter depends upon the early recognition of the lesions, I have kept careful measurements of the amount of urine passed during the first forty-eight and seventy-two hours in a series of 100 celiotomies for all causes, and, having found these statistics very useful for reference myself, I have presented them to the Academy of Surgery, hoping that they may also be of use to others. I do not think that the ureter was injured in any one of these cases. The patients all recovered easily, and have never shown any symptoms of ureteral obstruction or of any renal disturbance. In some of the cases, when the amount of urine passed was exceedingly small, the operation had been of such a character that injury to the ureters was impossible,—as in ventro-fixation of the uterus. In all of the cases in the table the kidneys seemed to be functionally normal before the operation. As the amount of urine secreted depends upon the food and drink of the person, it is important in connection with this table to mention the treatment of the patient in regard to this point.

The patient was generally operated on at 11 A.M. The last meal was given the night before. A small amount of water was given in case of thirst on the morning of the operation. Small increasing quantities of hot water were given first twenty-four hours after the operation; and food was first administered forty-eight hours after the operation. The women were also thoroughly purged with saline purgatives during the twenty-four hours preceding the operation.

It will be observed from the table that the minimum amount of urine, four ounces, passed during the first twenty-four hours, was in a case of unilateral oöphorectomy, the maximum amount, twenty-two ounces, being in a case of ventral hernia. The average amount for all the cases was for first twenty-four hours, 13.4; for second twenty-four hours, 14.6; and third twenty-four hours, 19.8.

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HYSTERECTOMIES: INTRAPERITONEAL TREATMENT OF STUMP.

No.	Amputation through Cervix.	Amputation at Vaginal Junction.	Number of Ounces of Urine Passed.		
			1st Day.	2d Day.	3d Day.
1	..	1	20	13	24
2	..	1	13	15	23
3	1	..	13	19	25
4	1	..	18	17	20
5	1	..	17	12	14
6	..	1	11	12	17
7	..	1	13	16	28
8	..	1	14	18	20
9	1	..	12½	13½	13
10	1	..	17	17	17
11	..	1	9	16	17
12	..	1	14	13	14
13	1	..	14	16	22
14	..	1	6	21	..
15	1	..	9	15	..
16	1	..	16	18	..
17	1	..	14	22	..
18	1	..	16	14	..
19	1	..	15	22	..
20	..	1	10	13	..
21	1	..	10	11	..
22	1	..	21	13	..
23	1	..	14	11	..
24	1	..	13	15	..
25	1	..	15	20	..
26	1	..	15	12	..
27	1	..	13	10	..
28	..	1	14	12	..
29	1	..	11	17	..
30	1	..	17	20	..
31	1	..	18	12	..
32	1	..	17	12	..
33	1	..	13	12	..
34	1	..	17	8	..
35	1	..	10	14	..
36	..	1	18	14	..
37	1	..	14½	10	..
38	1	..	18	16	..
39	..	1	7	10	..
40	..	1	10	28	..
41	1	..	21	14	..
42	1	..	10	13½	..
43	1	..	16	14	..
44	1	..	12½	12	..
45	1	..	14	17	..
46	1	..	12	15	..
47	1	..	13½	15	..
48	1	..	15	18	..
	35	14	672	617	254
Average per day			13.9	14.9	19.5

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OÖPHORECTOMIES.

No.	Unilateral.	Bilateral.	Number of Ounces of Urine Passed.		
			1st Day.	2d Day.	3d Day.
1	..	1	14	17	26
2	..	1	17	15	22
3	1	..	13	17	23
4	1	..	18	19	22
5	1	..	18	14	20
6	..	1	8	13	19
7	..	1	12	19	12
8	..	1	11	32	26
9	..	1	13	12	14
10	..	1	14	8	12
11	..	1	14	12	20
12	..	1	12	7	10
13	..	1	13	12	14
14	..	1	14	15	14
15	1	..	4	12	19
16	..	1	20½	17	21
17	1	..	16	14	23
18	..	1	14½	12	16
19	1	..	15½	14	14
20	1	..	14	11	28
21	..	1	9	6	..
22	..	1	15	16	..
23	1	..	14	15	..
24	..	1	11	16	..
25	..	1	18	25	..
26	..	1	27	20	..
27	..	1	14	10	..
28	1	..	9	20	..
29	1	..	10	16	..
30	..	1	16	20	..
31	..	1	19	25	..
32	..	1	12	14	..
33	..	1	7	10	..
34	..	1	17	13	..
35	1	..	12	10	..
36	1	..	14	10	..
37	1	..	13	13	..
38	..	1	14½	19	..
39	..	1	10	14	..
40	1	..	12½	12	..
41	..	1	13	17½	..
42	1	..	4½	7	..
43	..	1	9	9	..
44	1	..	22	16	..
45	..	1	8	25	..
46	..	1	10	16	..
47	1	..	14	15	..
48	..	1	18	15	..
49	..	1	7	12	..
50	1	..	6½	15	..
	18	32	661½	743½	375
Average per day			13.2	14.8	18.7

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CELIOTOMIES WITHOUT REMOVAL OF STRUCTURES.

No.	Ventro-fixation.	Hernia.	Exploratory.	Number of Ounces of Urine Passed.		
				1st Day.	2d Day.	3d Day.
1	..	1	..	21	19	20
2	..	1	..	22	13	15
3	1	..	..	6	15	20
4	1	..	..	16	10	20
5	..	..	1	6	10	..
6	1	..	..	9½	8½	18
7	..	..	1	19	23	22
8	..	..	1	8½	21	..
9	..	..	1	13	15	26
10	..	..	1	10	16	27
11	..	..	1	14	10	..
12	1	..	..	10½	10	..
13	1	..	..	17	16	..
	5	2	6	172½	186½	150
Average per day				13.2	14.3	21.4
General average of all cases for first, second, and third days				13.4	14.6	19.8
Total number of cases, 111.						

CLINICAL DEPARTMENT.

CLINICAL REPORT OF SOME INTERESTING SURGICAL CASES.[1]

FRACTURE OF NECK OF RADIUS.

CASE I.—Miss M., single; aged 60. On August 12, 1892, she tripped and fell down a slight incline, falling on and injuring her left arm. I did not see her till the eleventh day after the accident, when I happened to be passing, and was asked to stop and prescribe for a sprained arm.

Examination showed a forearm considerably swollen and discolored even to the hand. The patient was unable to pronate or supinate the hand or flex the forearm. Placing my finger over the head of the radius and forcibly supinating and pronating the hand, I failed to feel the head of the bone rotate. There was much pain complained of, and crepitation was very patent.

Diagnosis.—Fracture of neck of left radius.

Treatment.—Internal rectangular splint and compresses over seat of injury, held in position with spiral reversed bandage. Owing to the

[1] Read before the East Tennessee Medical Society, at Knoxville, May 24, 1894.

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difficulty in keeping the dressing on the limb, I removed splint and applied a plaster dressing. Patient recovered with a fairly useful arm.

According to Agnew and Ashhurst this is a very rare injury, only one or two cases being on record, and one of these is in the Mütter collection in College of Physicians, Philadelphia. On the other hand, Mr. South says fracture of the neck of the radius is quite common. Of three cases of injury in this region Hamilton was not convinced that fracture of the neck of the radius existed. Sir Astley Cooper says it cannot occur, and Malgaigne says it is quite uncommon.

FISTULA IN ANO.

CASE II.—Man; white; aged 43; teacher. For six years before operation had been troubled with fistula in ano.

Examination showed a complete fistula in ano on left side one and one-half inches in length, extending towards centre of perineum.

Operation.—October 18, 1892, I laid open tract and dissected it out, when I found it had burrowed up the left side of the bowel for two inches, also encircling the anus for two-thirds of its circumference. Laying open the ring around the anus with a bistoury, I then tore through the bowel with my fingers as far as the upper limit of the tract at its side (which prevented much hemorrhage), and packed the entire tract twice daily with bichloride gauze, allowing it to fill up from the bottom. Patient improved from the start, and was dismissed as cured November 18.

The wonderful achievements of modern surgery are nowhere better illustrated than in the treatment of phlegmonous inflammation with suppuration and its allied diseases, such as progressive purulent infiltration.

This is due entirely to a better understanding of the etiology and pathology of the affection, together with a knowledge of the means that will render a further progress of the disease impossible, by entirely destroying the noxæ, or at least holding them in abeyance till the depraved tissues have sufficiently recovered themselves to successfully combat the microbes and their ptomaines.

The etiology is the same whether it results in phlegmonous inflammation with suppuration, progressive purulent infiltration, or progressive gangrene. And whether one or the other affection obtains depends in a large measure upon the injuring force, the physiological condition of the tissues,—whether or not they are below par,—the activity of proliferation, the virulence of the microbe, and last, but by no means least, the proper treatment of the primary lesion.

Given a minute infection atrium, such as a small abrasion of the skin, carelessly treated, as by the application of the now obsolete

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poultice, which invites the entrance of the pus-microbe with all the dire consequences of its too rapid proliferation, the end is too often death from pyemia or exhaustion.

Whether fortunately or unfortunately, it has been my lot to have under my observation within the last few months two cases that punctuate very forcibly the importance of early and thorough attention to the antiseptic treatment of wounds, however trivial. The first was forced to undergo a mutilating operation; the second barely escaped with his life.

GANGRENE OF FOOT FOLLOWING PUNCTURED WOUND; AMPUTATION.

CASE III.—Man; white; past the meridian of life. Has always had fairly good health, though a cripple from his youth up. February, 1892, he accidentally inflicted a punctured wound with an iron poker, penetrating between the first and second metatarsal bones of the left foot. This was followed in a few days by a rapidly-swelling, painful, ascending, progressive gangrene, involving the entire foot and extending up to the junction of the lower and middle third of the leg. When I saw him, several days after the accident, he told me the pain had suddenly ceased, which at once excited my suspicion. He also had considerable fever, bounding pulse, anorexia, thirst, and diarrhea.

The objective symptoms were a very much swollen foot and leg of a pale, waxy color, bordering on a greenish hue; boggy crackling on pressure, and covered with bullæ. In places the part showed black spots and emitted an offensive odor, indicating the entrance of gasogenic bacteria. I at once advised amputation, and with the patient's consent I performed Sédillot's operation, using, of course, all antiseptic precautions. The patient rallied well, and ultimately though slowly recovered, and is well to this day.

EXTENSIVE PHLEGMONOUS INFLAMMATION FOLLOWING SLIGHT WOUND OF LEG.

CASE IV.—G. B.; man; white; aged 40; laborer. I first saw patient September 1, 1893, but one week previously he had knocked the skin about the size of a silver half-dime off of right shin. The attending physician, an eclectic, had used poultices in the mean time. The leg was considerably swollen from a little below the calf upward to the middle of the posterior surface of the thigh; this area was deep red in color and boggy on pressure. The swelling did not involve the entire limb, only its posterior surface, being influenced, no doubt, by gravitation.

However, it did undermine skin on outer and front of the thigh up to the junction of middle and upper thirds. Thoroughly cleansing the limb with antiseptics, I made three or four long incisions over the

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calf and popliteal surface of thigh, inserted drainage-tubes, irrigated with bichloride solution, 1 to 1000, and iodine water and peroxide of hydrogen solution. It was then dusted with iodoform powder, covered with iodoform gauze and bichloride cotton.

This was in the afternoon. By morning it had extended up the thigh six inches, necessitating another long incision and more drainage, with the same dressing as in previous sitting. By the following afternoon the onward march of the disease had burrowed above the crease between the buttock and thigh, the redness extending to the crest of the ilium. I made another incision just below the above-named crease, and, in addition to the previous course of treatment, used all night a constant stream of a warm boracic solution, which seemed to stay the spread of the disease.

Subsequently large pieces of necrotic connective tissue were thrown off, leaving the muscles in places absolutely bare, especially over the calf and above the popliteal space. The patient ultimately recovered, after an illness of several months. I am under many obligations to Dr. A. D. Scrugg for valuable assistance in the treatment of this case.

TALIPES EQUINO-VARUS; UMBILICAL HERNIA.

CASE V.—Boy, aged 10 months. Had congenital talipes equinovarus of both feet. Operated on both feet twice, dividing in the first sitting the tendo Achillis, the tendons of anterior tibials and plantar fasciæ, then placing in plaster casts. Result, *nil.*

A second sitting was necessary, when the anterior tibial tendons and the plantar fasciæ were divided, and plaster applied as before. Result: right foot negative; left foot straight. Subsequently the child developed an umbilical hernia.

December 9, 1893, assisted by Drs. C. Deaderick and C. P. McNabb, I operated for the radical cure of umbilical hernia by cutting down through the navel, dissecting up the sac for a short distance inside of the ring, and tying kangaroo tendon around the sac at the margin of the ring. This acted as a plug in the ring. After cutting away the redundant portion of the sac, the stump was fastened in the opening, using Halstead's mattress suture of kangaroo tendon by passing from one side of the margin of the ring to the other, then back again, each time including the peritoneal plug in the suture, and tying the suture at the starting-point. I used three sutures of kangaroo tendon. Then, removing an elliptical piece of skin, I closed up the skin wound with silkworm gut and applied an antiseptic dressing. The wound healed kindly, without the formation of pus and without fever. Result, good.

April 20, 1894, assisted by Drs. C. Deaderick and E. L. Deaderick, I did Phelps's operation on the right foot.

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An open incision was made, "commencing in front of the ankle-joint, extending across the inner side and two-thirds the distance across the sole of the foot through the skin and cellular tissues," dividing everything tense down to the bone until the foot could be placed in a supercorrected position, when I applied a plaster cast to retain it there.

In addition to the deformity of talipes equino-varus, the cuboid bone of the foot was displaced.

Result good. Child is now walking on the foot.

CASE VI.—M. L.; white; aged 14. On January 1, 1894, let fall a pane of glass across anterior surface of right forearm, one and a half inches above wrist-joint, making an ugly gash two inches in length, running upward and inward, and severing the flexor carpi ulnaris muscle where it joins the tendon. I flexed wrist and forearm in order to relax tendon and muscle (the muscle having retracted two inches or more within its sheath), then approximated the cut ends with catgut, making the first suture penetrate the entire thickness of the muscle and its tendon half an inch or more from the cut end. Then I applied superficial sutures of catgut before and behind, and closed the wound in the skin with silkworm gut, between the alternate threads of which I inserted fine aseptic silk so as to bring the skin *vis-a-vis*, thus making the least possible scar. The proper antiseptic dressings were applied, over which I fastened an anterior obtuse-angle splint of sole-leather, to which I bound the forearm and hand so as to keep the muscles relaxed. January 26, dismissed patient as cured and with function of cut muscle fully restored.

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ALUMNI NOTES.

THE UNIVERSITY OF PENNSYLVANIA ATHLETIC ASSOCIATION.

THE thirteenth annual meeting of the University of Pennsylvania Athletic Association was held on December 11, 1894, in the University Chapel, and was very largely attended by the undergraduates and alumni. The treasurer's report, which shows that for the first time in its history the Association is free of debt, and has in its treasury nearly $9000, contains some very interesting figures.

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The receipts and expenses for the three big foot-ball games were as follows :

	Receipts.	Expenses.	Net to Each Team.
Princeton	$19,960.00	$6,191.75	$6,884.12
Cornell	6,578.00	3,017.76	1,780.37
Harvard	38,843.25	11,248.48	13,797.38
Total	$65,381.25	$20,457.99	$22,461.87

The financial statement for the fiscal year ending October 1, which does not include this season's receipts from foot-ball, shows the following results :

	Receipts.	Expenses.
Foot-ball	$23,995.55	$11,728.13
Base-ball	8,887.53	9,691.67
Rowing	1,723.10	5,903.36
Track	188.60	2,831.85
Contributions	5,900.32	
Cricket	. . . . .	196.00
Ground and training-house	. . . . .	6,760.33
General expenses	. . . . .	3,534.27

The decided stand against professionalism taken long ago by the Association was emphasized by the adoption of a clause restricting from candidacy on any Pennsylvania team any student playing on one of the so-called "summer base-ball nines" who shall receive any money, either directly or indirectly, in recognition of his services, or on which team any player receives such remuneration.

The membership of the Athletic Association is now 859, of which 315 are graduates, 492 undergraduates, and 52 life members.

Necrology.

Dr. Reid Alexander died in Topeka, Kansas, in October, of perforation of the bowel. He graduated from the Medical Department of the University in 1885, and at the time of his death was president of the Topeka Academy of Medicine and Surgery.

Appointments.

Dr. Charles A. Oliver has been elected an honorary member of the Pueblo County Medical Society.

At the last regular meeting of the trustees of the University Dr. William S. Carter was elected Assistant Professor of Comparative Physiology in the Veterinary Department.

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Drs. Henry Carmany, Clarence J. Garitee, and George McLeod were recently appointed resident physicians at the Episcopal Hospital.

At a meeting of the Department of Charities and Correction, held on December 11, 1894, the following graduates of the University were elected to the visiting staff of the Philadelphia Hospital: Dr. Richard C. Norris, obstetrician; Dr. Hobart A. Hare, physician; and Dr. Charles A. Oliver, ophthalmologist.

James Tyson Medical Society.

A new undergraduate medical society has been organized in the University, and is known as the James Tyson Medical Society. This is the seventh society of undergraduates in active operation in the Medical Department.

Celebration of Washington's Birthday.

The managers, faculty, and students of the University will celebrate the anniversary of the birth of George Washington on Friday, February 22. Governor-elect Hastings has signified his intention of being present at the ceremonies, which are to be held in the Academy of Music from eleven to two o'clock. The Governor, being *ex-officio* president of the Board of Trustees, will preside at the meeting, and make a short address. Short speeches will also be made by Mr. C. C. Harrison, acting provost, Dr. Fullerton, George Wharton Pepper, and others. Judge Thayer will make the principal oration of the day in commemoration of Washington.

The arrangements for the ceremonies are to be under the direction of Mr. E. G. McCollin. The students will march in from the University, the First Troop, Philadelphia City Cavalry, acting as the Governor's escort.

Von Bülow's Brain.

Hans Von Bülow, the eminent pianist and conductor, who died at Cairo in February last, had for years been a martyr to maddening headaches. In accordance with his often expressed wish, after his death, Professor Kaufmann, of Cairo, who performed the post-mortem examination, extracted the brain, and sent it to a German physician for examination. It now appears that the surface origin of two nerves leading to the scalp was embedded in a scar, left by an attack of meningitis in early youth. Whether this scar can be held responsible for the great artist's many eccentricities must remain an open question.—*Medical Record.*

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EDITORIAL.

NEW OPERATIONS FOR THE RADICAL CURE OF INGUINAL HERNIA.

In spite of the already large number of methods which have been devised for the radical cure of hernia, the list still grows apace. This is conclusive evidence that we have as yet no method that is uniformly successful. All conservative writers agree that after every one so far devised there will be a large number of recurrences. The reason for so large a proportion of failures is not difficult of explanation. The success of the operation depends, of course, upon securely obliterating the canal through which the hernia descended. Operators have displayed great ingenuity in devising means to secure this obliteration, the success of which depends upon the various structures retaining the positions in which they are placed at the time of operation. Unfortunately this expectation is not realized. The stitches give way, or the transplanted flap undergoes atrophy in the new position, and but little resistance is left to the redescent of the hernia. It will be remembered, of course, that most of these operations are performed in cases in which the tissues are altered by the long-standing rupture. The truss still remains, therefore, the best method of dealing with a reducible hernia, if it can be retained thereby.

There are cases, however, in which for different reasons some form of operation becomes necessary, and there is no doubt that the technique is constantly being improved. Another "new" operation for hernia has just been published by A. M. Phelps (*New York Medical Journal*, September 8, 1894). The points upon which Dr. Phelps lays stress are, the fortifying of the internal ring, the obliteration of the inguinal canal, and the formation of an artificial canal for the cord external to the muscles. These features are not entirely new in themselves, although they are attained in a somewhat different manner from the methods previously described. Briefly, the operation is as follows. A long incision is made, extending at least two inches beyond the internal ring, down to the transversalis fascia, the sac is opened, and the intestine replaced. A suture is passed round the neck of the sac like the puckering string of a pouch, and two-thirds or more of the sac cut away. The stump is then inverted with forceps into the

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abdominal cavity, and the string tied tight; one or two stitches are then taken across the neck of the sac. The muscles are next dissected up from the transversalis fascia, a distance of an inch and a half either way from the internal ring. In order to sew up the latter the edges of the fascia forming the ring should be denuded, and then for a half inch to an inch on either side of the ring two parallel longitudinal incisions are made (or if the fascia is thick and adherent to the sac it can be included with the ligature and inverted with the sac into the abdominal cavity). The fascia is then stitched with interrupted fine wire sutures over the stump. Over this fascia are placed loops of silver wire, knotted in several places to prevent slipping if the hole is a large one. Four or five of these loops, two or three inches long, will suffice. The cord is raised from the canal and the loops passed underneath from the internal to the external abdominal ring. Over these loops the transversalis muscle is carefully stitched with interrupted sutures, the cord being brought through the muscle direct; the first layer of wire or catgut should run transverse to the inguinal canal. Over the transversalis muscle another layer of wire loops is passed extending at right angles to the deeper layer. Each wire loop is stitched to the muscle to prevent it from slipping. Over this layer of wire the internal oblique muscle is stitched with interrupted sutures, the cord being brought out through this muscle. The external oblique is then stitched. The wound is closed if there is but little adipose tissue, and left open if there is a thick layer. A small drainage-tube or a few strands of catgut are used for drainage. A large number of cuts accompany the article, which serve to render the procedures more easily understood.

Dr. Charles Reed in a recent address (*Cincinnati Lancet-Clinic*, September 22, 1894) contends that the cause of recurrence after the radical cure of hernia is due to performing the operation through the canal itself, leaving an infundibular peritoneum and a serous track, which, particularly in congenital cases of scrotal hernia, is left in primitive continuity, being only temporarily obstructed by inflammatory exudate. An operation devised by Dr. Reed, which has proved primarily successful in his hands, and which meets the objections mentioned, is thus described by the author. In inguinal hernia an incision is made from a point two inches above Poupart's ligament midway between the anterior superior spinous process of the ilium and the spine of the pubis, obliquely downward and inward, as nearly as possible coincident with the axis of the inguinal canal to a point at the base of the scrotum. The dissection is then carried into both cavities. The protruding viscera are reduced and carefully inspected after being brought out above, and the sac is dissected from its scrotal connections

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and reversed by invagination. It is then opened by two incisions, one towards the pubis, the other towards the ilium, and being thus converted into an anterior and a posterior flap. The cord is next dissected loose and caused to enter the canal, now denuded of its peritoneum at its outer angle. The internal ring is closed by several interrupted sutures,—animal or pure silk,—applied beneath the peritoneal flaps formed by splitting the sac, care being taken that in the closure of the ring undue pressure shall not be brought to bear upon the cord. The posterior peritoneal flap is excised, the stump being ligated if thought desirable.

The anterior peritoneal flap is carried across the now obliterated internal ring and stitched by interrupted sutures to the posterior parietal peritoneum. The external ring is now closed by passing a number of sutures through its pillars external to the corner, which is now fixed in the internal (pubic) angle of the outlet of the canal. The incision in the abdominal wall is closed by interrupted figure-of-eight sutures, the internal loop embracing the peritoneum, the aponeurosis of the transversalis, and of both oblique muscles, and the external loop embracing the skin and subcutaneous tissues. The sutures should not be more than three-sixteenths of an inch apart. Drainage is not to be employed except in the presence of marked oozing or obvious infection.

The first method seems objectionable theoretically on account of the necessity of using the silver-wire loops. Whether or not the second method will prove more uniformly successful than others that attempt to secure the same end by more or less different procedures remains to be demonstrated. It will be accepted without argument that no one operation will be applicable in every instance. It will be sufficient, however, for the surgeon to have in mind a few of the principal operations, inasmuch as the modifications in so many methods are but trivial and unimportant.

SHALL THE "INDEX MEDICUS" BE CONTINUED?

Dr. H. A. Hare, editor of the *Therapeutic Gazette*, is authorized by the publishers to state that the *Index Medicus* will be discontinued with the February issue, unless 500 new subscribers can be secured. The reason for this action is lack of financial support. Any one who has had occasion to use this valuable work will appreciate at once the great loss which would be sustained by its discontinuance. It should be an easy matter to secure the necessary number of new subscribers, and it is hoped that an effort will be made by all interested to accomplish this end.

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MEDICAL PROGRESS.

MEDICINE.

UNDER THE CHARGE OF

WILLIAM PEPPER, M.D., LL.D., AND JAMES TYSON, M.D.,

ASSISTED BY

M. HOWARD FUSSELL, M.D.

ANTITOXIN IN DIPHTHERIA.

BAGINSKY (*New York Medical Record*, October 6, 1894), in the course of an article in this journal, reports 163 cases of diphtheria, which were treated by antitoxin, with a mortality of 14.37 per cent. The heart was not affected in any way. In one case a small abscess followed the injection, but was speedily cured. Exanthema followed in several cases; there was no rise of temperature, but the rash looked like scarlet fever, nettle-rash, or measles. Constitutional symptoms were never noticed. If the case was bad, with weak heart-sounds, the remedy did not seem to influence this. There was no specific effect which could be attributed to the treatment. The mortality among tracheotomized cases treated with antitoxin was less than on former occasions. Twenty-five cases which had been exposed to diphtheria were carefully examined, and all developed the disease. They were treated with antitoxin in the very beginning, and all were discharged cured. Seventy-two cases were treated for immunity, and only eight of these cases developed the disease in a mild form, and all recovered.

FISCHER (*Ibid.*) describes the serum as a clear, colorless liquid, of thick consistence, and quite sticky, of a slight carbolic odor. There are two kinds manufactured by rival firms,—the Behring-Ehrlich heilserum, and the Aronson heilserum. Two objects are sought in using the antitoxin:

(1) Immunity during an epidemic, or where a person has been exposed to diphtheria.

(2) Healing after the disease exists. The usual dose is five to ten cubic centimetres, hypodermically.

Malignant cases of diphtheria often recover, and quite frequently cases of laryngeal stenosis recover.

ROUX (*Lancet*, September 22, 1894), after making some general remarks upon serum therapy in general, describes his treatment of a horse until its blood manifested antitoxic properties. It was the blood-serum from the horse that he used in the treatment of children sick with diphtheria. They first inoculated the vulvæ of guinea-pigs with diphtheritic membrane, and then treated the animals with serum. Even a few hours after the injection of the serum the redness and injection disap-

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pear, and the membrane becomes detached. The treatment of children sick with diphtheria, in the Children's Hospital, l'Hôpital des Enfants Malades, was begun February 1, 1894. They had several horses immunized, so they could use large quantities of serum. The wards were visited every day, and the children treated in whatever stage they were found. No selection was made, the nursing was not changed, the local treatment was the same as at other periods, so that the results can be compared with those previously treated. The experiments were made from February to July. Besides, the results may be compared with those in another children's hospital in Paris, where serum was not used during the above period. The mortality during the past four years averaged 51.71 per cent. From February 1 to July 24, 1894, 448 patients were treated with serum, with a mortality of 24.5 per cent. During the same period 520 children were treated for diphtheria in the Trousseau Hospital without serum, with a mortality of 60 per cent. Of the above 448 cases only 300 had true diphtheria, in these there was a mortality of 26 per cent. as compared with a mortality of 50 per cent. in former years. All children had twenty cubic centimetres of the serum administered at the time of admission. If the injection is properly made into the subcutaneous cellular tissue it is soon absorbed and is painless. In diphtheritic children a second dose of twenty cubic centimetres or ten cubic centimetres is given, which is sufficient as a rule to effect a cure. The pulse and temperature were the guide; so long as they remained high the injections were continued. During convalescence an urticarial rash sometimes appeared; it was unaccompanied by fever. The principal modifications produced by the serum upon diphtheritic angina are the following: The general condition remains good or improves, provided the treatment is not begun at too late a period. The pale and leaden face was scarcely seen in the wards. The duration of the disease is curtailed. The appetite quickly returns. The complications are lessened and are less severe. The false membrane disappears in from thirty-six to forty-eight hours. The diphtheria bacilli disappear from the throat at the same time as the false membrane. The irregularities of pulse in convalescence were not noticed in the serum cases.

The local treatment used in addition to the serum is a simple boric acid wash; no carbolic or sublimate.

Diphtheria and Pseudo-Diphtheria.

Park and Beebe (*New York Medical Record*, September 29, 1894), in a report to their chief, Dr. Biggs, of the New York Health Board, record 5611 cases of suspected diphtheria; of these 3255 were found to contain the Lœffler bacilli, in 1540 no diphtheria bacilli were present in the cultures, and as these cultures had been made in an early period of the disease, the cases from which they were taken may be considered as *not* to have been true diphtheria. In 1816 cases, although no diphtheria bacilli were found in the cultures, yet, for various reasons, the cases were considered to be of a doubtful nature, although they were probably not diphtheria. Thus of the 5611 cases of suspected diphtheria, it would probably be just to consider that 60 per cent. were true, and 40 per cent. false diphtheria.

In true diphtheria the ages of the cases attacked range between 3 weeks and 70 years. The number of cases increased with each twelve months of life up to the fourth year, and then gradually diminished. The mortality was highest in the first two years of life, and then steadily diminished until adult life was reached, when it again slowly increased. Scarlet fever was associated with diphtheria in about 5 of every 1000 cases; 450 cases of false diphtheria were investigated, and there were eleven deaths; five of the deaths occurred in children under 5 years of age, and were all laryngeal cases.

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Membranous Croup.—In 286 cases examined the disease was confined to the larynx or bronchi, three of these were in adults. In the cultures of 229 of the cases Lœffler's bacilli were found, and they were thus proved to be true diphtheria. In 167 of these 229 cases there was no exudate above the larynx. In 57 of the 286 cases examined no diphtheria bacilli were found, but in 17 of these the cultures were unsatisfactory, leaving 40 cases of croup in which diphtheria bacilli were certainly absent. In 13 of the cases there was more or less exudate on the tonsils or pharynx.

The Value of a Bacteriological Diagnosis.—After a year's trial the following conclusions have been arrived at. The examination by a competent bacteriologist of the bacterial growth in a blood-serum tube, which has been properly inoculated and kept for fourteen hours at the body temperature, can be thoroughly relied on in cases where there is visible membrane in the throat, if the culture is made during the period in which the membrane is forming, and no antiseptic has been lately applied. In cases where the disease is confined to the larynx surprisingly accurate results can be obtained, but in a certain proportion of cases no bacilli will be found from the first examination, and yet will be abundantly present in later ones. In nasal diphtheria a negative result may be obtained from a culture made from the throat, and yet the bacilli be found in cultures made from the nose.

For diagnostic purposes it must be considered that all bacilli found in throat inflammations suspected to be diphtheria, which possess the morphological and cultural characteristics of Lœffler's bacilli, must be considered as virulent unless animal inoculations prove otherwise. Further, it has been shown that the absence of virulence in a culture derived from one bacillus is not sufficient to prove that cultures from other bacilli of the same case would not be virulent.

Length of Time Bacilli Persist in the Throat.—In 605 convalescent cases 304 showed an absence of the bacilli within three days after the complete disappearance of the membrane. In 301 cases the bacilli persisted for a longer time: in 176 cases for 7 days; in 64 cases for 12 days; in 12 cases for 3 weeks; in 4 cases for 4 weeks; in 4 cases for 5 weeks; and in 2 cases for 9 weeks after the time when the exudate had completely disappeared from the upper air-passages.

The Relation of the Pseudo to the True Diphtheria Bacillus.—The authors have examined 330 healthy throats and found *eight* of the cases to contain *characteristic virulent* diphtheria bacilli. Twenty-four of the cases contained non-virulent characteristic diphtheria bacilli, and twenty-seven contained non-virulent pseudo-bacilli. They conclude that virulent diphtheria bacilli are to be found in the throats of a small proportion of healthy persons throughout the city, and that they have been derived either directly from diphtheria cases or from those who have been in contact with them. As the bacilli in cases of true diphtheria are known to gradually lose their virulence, and as this loss of virulence can be caused artificially, it seems to the writers that these bacilli, characteristic except as to virulence, should be regarded as true diphtheria bacilli which have lost their virulence. In the twenty-seven cases of pseudo-diphtheria there were differences in staining, etc., which give abundant reason to separate them from true bacilli.

Virulent bacilli may be received (1) from discharges and membranes from diphtheria patients. (2) From the secretions of the throat and nose of convalescent cases in which the bacilli persist. (3) From the throats of healthy individuals who have acquired the bacilli by being in contact with others having virulent germs on their persons or clothing.

The conclusions reached by the authors are here appended. They seem justi-

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fied by the article of which the above is a very brief abstract. The article is worthy of very careful reading by all physicians.

(1) All inflammations of the mucous membrane due to the diphtheria bacillus of Lœffler should be included under the name diphtheria, and in this report they have been so included. An acute hyperemia of the mucous membrane, caused by the Lœffler bacilli, is considered as truly diphtheritic as an inflammation with pseudo-membrane or exudate, and a case in which the lesions are confined to the larynx or bronchi as truly diphtheria as one in which the tonsils and pharynx are involved.

(2) Under pseudo-diphtheria should be included all inflammations of the mucous membranes which simulate true diphtheria and which are due to streptococci, or, more rarely, other cocci.

(3) The name croup, or membranous croup, should be regarded as a term merely indicating that the location of the pseudo-membranous or exudative lesion is in the larynx, and not as describing the nature of the disease, whether diphtheritic or pseudo-diphtheritic. In New York City, at the present time, 80 per cent. of the cases of "croup" are diphtheria.

(4) The examination of cultures made upon solidified blood-serum under the conditions insisted on by the department form a reliable method for determining whether the diphtheria bacillus is present or absent in a throat. For diagnostic purposes cultures should be made before the pseudo-membrane or exudate begins to disappear.

(5) Virulent diphtheria bacilli were apparently present in about 1 per cent. of the healthy throats in New York City at the time of these examinations. Diphtheria was, however, rather prevalent at this time. Most of the persons in whose throats they existed had been in direct contact with cases of diphtheria. Very many of those whose throats contain the virulent bacilli never develop diphtheria. We must, therefore, conclude that the members of a household in which a case of diphtheria exists should be regarded as sources of danger, unless cultures from their throats show the absence of virulent diphtheria bacilli.

(6) The bacilli found in the original serum cultures which in appearance and staining are identical with the typical Lœffler diphtheria bacillus may be regarded for diagnostic purposes as virulent diphtheria bacilli, if the cultures have been made either from throats containing exudate, or from those of persons who have been in contact with true diphtheria; for investigation has shown that over 95 per cent. of such bacilli are virulent. Bacilli, on the other hand, which resemble the pseudo-diphtheria type must be subjected to both cultural and animal experiments before their nature or virulence can be judged.

(7) All bacilli which are identical with the virulent Lœffler diphtheria bacillus, morphologically, biologically, and in staining by reagents, should be classed with the diphtheria bacilli, whether they have much, little, or no virulence when tested on guinea-pigs. Bacilli which have entirely lost their virulence rarely, if ever, regain it. They probably are incapable of causing diphtheria, for the twenty-four cases in which they were found by us never developed any lesions, nor were they the original of any case of diphtheria, so far as could be ascertained.

(8) The name pseudo-diphtheria bacillus should be regarded as applying to those bacilli found in the throat which, though resembling the diphtheria bacilli in many respects, yet differ constantly in others equally important. These bacilli are rather short, and are more uniform in size and shape than the typical Lœffler bacillus. They stain equally throughout with the alkaline methyl-blue solution, and produce alkali in their growths in bouillon. They are found in about 1 per cent. of the healthy throats in New York City, and seem to have no connection with diphtheria. They are never virulent.

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(9) One or more varieties both of streptococci and of other forms of cocci exist in the great majority, and possibly in all, of the healthy throats in New York City. Cultures from the throat in cases of pseudo-diphtheria contain more cocci, especially more streptococci, than those from healthy throats, but otherwise do not seem to differ.

(10) The investigations of the health department have given striking evidence of the marked difference in mortality between true and pseudo-diphtheria, for while it was 27 per cent. in diphtheria, it was under 2 per cent. in pseudo-diphtheria.

(11) The combined clinical and bacteriological investigation of over 5000 cases has demonstrated clearly the fact that many of the less characteristic cases of diphtheria are so similar in appearance, symptoms, and duration that it is impossible to separate them, except by bacteriological examinations. In the more severe cases, and after the disease has fully developed, cultures are less necessary, although their systematic use is desirable.

(12) Persons who have suffered from diphtheria should be kept isolated until cultures prove the bacilli have disappeared from the throat, for, not only are the bacilli which persist in the throat virulent, but they are not infrequently the cause of diphtheria in others. Where cultures cannot be made, isolation should be continued for at least three weeks after the disappearance of the membranes, for our experience has shown that it is not unusual for the bacilli to persist that length of time.

(13) In pharyngeal cases in which thorough irrigation of the nostrils and throat with 1 to 4000 bichloride of mercury solution has been practised every few hours, the bacilli have not remained in the throat for as long a time after the complete disappearance of the pseudo-membrane as when no antiseptic has been employed. Other antiseptic and cleansing solutions may also be useful.

(14) Inflammations of the mucous membrane due to streptococci, either alone or associated with other cocci, are usually mild in character. These inflammations may be more serious when the lesion is located in the larynx, or when they are complicated by scarlet fever or measles.

(15) While the streptococci, and perhaps other forms of cocci, may be considered as the primary etiological factor in pseudo-diphtheria, yet, in the majority of cases at least, certain predisposing factors, such as exposure to cold or other deleterious influences, or the presence of certain infectious diseases, appear to be of great importance in determining the occurrence of the disease. The streptococci which, under these conditions, apparently cause the disease are probably those which had for a long time existed in the throat, and not those freshly derived by communication with other cases of pseudo-diphtheria. In a small number of cases, indeed, the histories suggest a direct communication, but the causation may be equally explained by the supposition that the second case shared with the orignal one the same predisposing cause.

(16) The slight mortality and the usual mildness of the cases of pseudo-diphtheria do not warrant us in enforcing isolation, even if further investigation produce positive proof that this disease is communicable. With the results of these investigations before us we can appreciate the difficulty of exterminating diphtheria from a city like New York. On the one hand, we have cases of diphtheria scattered all through the city, many of which are so mild as to be unrecognized, and, on the other hand, we have the crowded tenements with their ignorant and shifting population, where proper isolation of the patient from other members of the family, or of the family from other inmates of the building, is usually impossible unless harsher measures are adopted than are now customary.

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SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

ASSISTED BY

G. G. DAVIS, M.D., M.R.C.S., AND ELLWOOD R. KIRBY, M.D.

RESECTION OF THE LOWER JAW.

MOTY (*Bulletin et Mémoires de la Société de Chirurgie*, February, 1894, XX, p. 53) presented two cases, in which he had resected one-half of the lower jaw, to the Paris Society of Surgery.

M. Berger remarked, in discussing the cases, that, notwithstanding that it has been regarded as an inevitable consequence of this operation that the remaining part of the jaw becomes deviated towards the resected side, in these two cases this distortion did not exist. This demonstrated that the immediate application of appliances to prevent this occurrence is not indispensable.

THE FLAP METHOD OF OPERATING.

CHIENE (*British Medical Journal*, October 6, 1894) advocates the more general use of the flap method of operating. It consists in exposing a part by means of a flap instead of making a direct incision down to it. The advantages claimed are that the wound in the deeper parts is at a distance from the skin wound, the skin over the deeper wound is not interfered with; it supports the deeper tissues which have been divided, and rapid healing takes place. The flap is composed of skin and subcutaneous tissue. It should, as a rule, be crescentic, and not horseshoe shaped. The incision should be made as far as possible from sources of septic infection. The main blood-supply should enter the base of the flap; this, however, is secondary. He recommends its use in the removal of loose cartilages from joints, in operations for hernia, in excision of the knee, in the removal of tuberculous glands, operations on the tendons, and in many other cases.

RESECTION OF SIX CENTIMETRES OF THE URETHRA.

ROLLET (*Lyon Médical*, March 25, 1894, p. 391) reports the case of a man, aged 39 years, who, as the result of venereal disease, had perineal fistula, and behind the scrotum a mass as big as a fist. He also had marked evidences of syphilis. An incision was made from the scrotum to within two centimetres of the anus. Through this incision was removed a mass as big as a large orange and weighing fifty to sixty grammes (750 to 900 grains). The length of the piece of urethra excised was six centimetres (two and three-eighths inches). A No. 21 Nélaton rubber catheter was tied in the bladder, and over it the soft parts were united by two rows of silk terraced sutures, and the skin united with silver sutures. The catheter was kept in place by a metallic suture passed through it and out on each side of the wound. On the thirty-sixth day the catheter was removed.

The wound healed by primary union. After the operation Nos. 21 and 22 French (Charrière) scale sounds were introduced. Rollet claims that in these cases the reconstructed urethra becomes covered again with epithelium, and adduces as proof that Poncet, some time after one of his resections, on making a perineal urethrotomy found such to be the case, also that Nogués found that the urethra of the dog after excision did not consist of a contractile cicatrix, but that it was completely covered with stratified pavement epithelium.

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Laryngectomy by a Novel Method.

Swain (*New York Medical Journal*, October 13, 1894) reports a case of laryngectomy done by Dr. Carmalt, assisted by Dr. Hawkes and himself; a preliminary tracheotomy was done thirteen days previous to the removal of the larynx. An incision was made from the tracheotomy wound to the sternum, and, the third and fourth tracheal rings having been divided, a sponge canula was inserted and moistened with water; thus the trachea was occluded. The incision was then prolonged up to the hyoid bone, and a cross-cut made to the sterno-cleido muscle on each side. The larynx was bared and bleeding points secured. A director was carefully passed between the trachea and esophagus, and the larynx separated from the trachea by cutting with a bistoury and dissected loose from below upward. When the arytenoid cartilages were reached the direction of the incision was changed and directed towards the base of the epiglottis, including in its path the mucous membrane covering the arytenoids and portions of the ary-epiglottic folds. The long corner of the thyroid cartilage was cut across. The epiglottis was finally cut across just through the tuberculum and the larynx soon freed from all attachments. The epiglottis was then stitched to the posterior border of the opening which had previously been the rima glottidis, and closed the ring completely, thus bringing the epiglottis in contact with the arytenoid mucous membrane, converting the ring into a linear wound running from side to side. A perfect anterior wall was thus made for the esophagus.

The patient made a perfect recovery, and could whistle and utter short sentences capable of being heard several feet away.

On the Love of Novelty.

Mitchell Banks (*British Medical Journal*, October 20, 1894), in opening the section of surgery in the meeting of the British Medical Association, called attention to the prevailing desire of those who wished to advance in their profession to advance suddenly into prominence by some bold, new feat. The bad results of such a course are shown by recalling the fate of the clever, intellectual Athenians, who "fell beneath the stern and steady Roman, and were but women in the eyes of Alaric's savage Goths." He claims it leads to dishonest statements as regards results, and the following words of Jacobson are quoted with approbation: "It is too much the fashion among the younger generation of professional men to associate eminence in surgery with some new method of procedure or some brilliant achievement in the way of an operation never thought possible. It is not remembered that the day after to-morrow the method will be supplanted by another, the operation will be discarded as useless or unjustifiable." In surgery, as in medicine, true greatness consists rather in the power of applying a wide and accurate knowledge to the elucidation of the numberless problems suggested by an extended clinical experience, in maintaining that balance of judgment which can withstand the temptations to adventurous brilliancy without becoming stagnated in the slough of servile adherence to tradition. If we look back at the history of surgery it will be found that the men who have left their mark are not the brilliant operators or learned investigators, but rather men who continually devoted great ability to the work of their profession, to the solution of the questions which daily present themselves for interpretation. They were men who spared no pains in their work, who shirked no difficulties, but they were men who ever placed the patient in the first place, and looked upon operative brilliancy as a means to an end.

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A Method of Excising the Prostate.

Nicoll (*Lancet*, 1894, Vol. I, p. 926) describes his operation for removal of the prostate gland. He has done the operation twice on living patients and suggests that it be given a trial. The technique is as follows: A suprapubic cystotomy is performed, the rectal bag, if used, being afterwards removed. The bladder incision must be a free one; all bleeding must be stopped, and the bladder wall secured to the skin with four sutures. The wound in the abdominal wall is to be dusted with iodoform before the bladder is opened. The bladder is well washed with carbolic acid solution 1 in 2000, some is allowed to remain in, and the patient placed in a lithotomy position. An ordinary bougie is passed into the urethra and held by an assistant. The left forefinger is put in the rectum, and an incision made in the perineal raphé and gradually deepened till the apex of the prostate is reached, but without penetrating the urethra or the bladder. The rectum is carefully separated from the posterior surface of the prostate, and a vertical incision made through the posterior and inferior part of the capsule. This is then gradually pushed off the gland to each side by means of some blunt instrument, the assistant pressing the prostate down into the wound with his fingers introduced suprapubically. Additional room, if necessary, is obtained by making two transverse incisions curved outward and backward. All bleeding points being secured, the surgeon, having cleansed his hand in carbolic solution, puts two fingers into the bladder from above and, pressing the prostate down into the perineal wound, removes, by the fingers of his right hand in the perineum, the entire prostate, or as much of it as deemed necessary. A blunt periosteal separator or even a Volkmann's spoon may be used, if necessary, for this purpose.

During the entire operation neither the bladder nor urethra is opened farther than is involved in the suprapubic incision. A large catheter is passed through the urethra and allowed to remain. The large perineal wound is stuffed with gauze. The four sutures in the bladder are cut and the bladder-wall thus allowed to drop away from the parietes.

Both operations which he did by this method gave satisfaction.

Treatment of Cases of Vicious Union after Fracture of the Upper Extremity of the Humerus.

Lejars (*Revue de Chirurgie*, 1894, p. 632) reviews the subject of vicious union after fractures of the upper end of the humerus and advocates operating on them. He gives two cases of his own besides other illustrative ones. His first case was in a boy aged 16 years. The injury had been diagnosed as a subcoracoid dislocation and ineffectual attempts made at reduction. On examination, previous to operation, a fracture was found through the epiphyseal line. The head was in place, but the upper end of the lower fragment was displaced upward, forward, and inward. Consolidation of the two broken ends was almost complete. There were disability, almost total, and atrophy of the deltoid. An incision was made in the deltoid-pectoral interspace, the cephalic vein ligated, the ends of the bone resected and fastened with four periosteal sutures of silk. The surrounding parts were united with catgut. No drainage. Union was complete in three weeks, and cure was perfectly satisfactory in every way. Case two was in a woman aged 34 years. The deformity was similar to that of the previous case. It was exposed as already detailed, and the head found to be in a position of axial rotation, its external surface looking almost forward. Considerable callus was removed, and movements of the humeral head made in all directions, but it was not thought advisable to separate the already united fragments. The wound was closed, and patient recovered use of her arm.

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Encysted Vesical Calculus.

Ferria (*Annales des Maladies des Organes Génito-Urinaires*, 1894, p. 652) reports a case of encysted calculus in a man aged 55 years. The patient was placed in the Trendelenburg position and 350 cubic centimetres of boric acid solution injected into the bladder. A suprapubic cystotomy was then done and attempts made to extract the stone. It was found firmly encysted in the lower back part of the bladder-wall and almost closed over by membrane. All attempts to grasp it with forceps or to pry it out of its bed were failures, and, bleeding obscuring the view, it was decided to attempt removal from behind. The wounds having been partially sutured, the patient was turned on his side, and an incision made beginning four fingers' breadths below the posterior superior iliac spine, extending along the sacro-coccygeal border and the raphé until within an inch of the anus. This was made on the right side. After dividing the insertion of the gluteus maximus muscle, the sacro-sciatic ligaments, the sacro-coccygeal and levator ani muscles, the calculus was felt. To give more room the coccyx was disarticulated and one-half of the last sacral segment removed. The rectum was pushed to the left and the peritoneum up. An incision four centimetres long allowed the stone to escape. Tampons of gauze were applied. The patient died seventy-two hours after the operation of suppression of urine.

Operative Treatment of Perforative Ulcer of the Stomach.

Gould (*British Medical Journal*, October 20, 1894), in a paper on this subject, states that we are without means of previously determining the seat of perforation, and deprecates any operation with a view to obviating the occurrence of perforation; 85 per cent. of gastric ulcers make a perfect recovery without any operative procedures.

The operation should not be done while the patient is suffering from the first shock of the perforation, but as soon as reaction has set in. It is better to wait an hour or two in order to obtain proper assistance and make full preparation rather than to operate under such adverse circumstances as to make success impossible.

The incision should always be made in the median line; if necessary, this may be enlarged transversely; the pain is no sure guide to the seat of the ulcer. The cleansing of the peritoneum is the important step of the operation. For this purpose irrigation with sterilized salt solution at a temperature of 110° to 112° F. is preferred.

When practicable the hole in the stomach should be sewn up with Lembert sutures. There appears to be no advantage in paring its edges. If it is impossible to close the opening on account of its location or wide-spread induration, then, if within reach of the abdominal incision, it may be secured to it, but in other cases a drainage-tube should be introduced and packed around with iodoform gauze. Drainage of the peritoneum should be practised in all cases in which peritonitis is marked; the tube is best placed in a separate incision above the pubes. To treat collapse, if hot irrigation is not sufficient then use intravenous injections of saline solution. There are five cases on record in which a perforated gastric ulcer has been deliberately cut down upon and sutured, and the peritoneum cleansed, and recovery has ensued.

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THERAPEUTICS.

UNDER THE CHARGE OF

HORATIO C. WOOD, M.D., LL.D., AND ARTHUR A. STEVENS, M.D.

MALAKIN IN ACUTE ARTICULAR RHEUMATISM.

MONTAGNON (*Sem. Méd.*, November 3, 1894) reports favorably upon the action of malakin in acute rheumatism. He states that it increases the urine, assists in the elimination of uric acid, and exerts, even in large amounts, no deleterious effects. While it lowers temperature, it does not induce gastric disturbances or ringing in the ears like the salicyl compounds. The average dose is one and a half drachms in the twenty-four hours, although as much as two and a half drachms may be given with safety, if properly divided.

THE VALUE OF REPEATED LAVAGE AT SHORT INTERVALS IN OPIUM-POISONING.

HAMBURGER (*Johns Hopkins Hospital Bulletin*, October, 1894) reports a case of opium-poison in a Chinaman, illustrating the importance of repeated lavage. It was thought that all the poison had been removed from the stomach at the first washing, but two subsequent washings, performed at intervals of several hours, yielded alkaloidal reactions. This reaccumulation of the alkaloids must have resulted from an excretion by the gastric mucous membrane; for it has been shown that it is in the stomach that the elimination of morphine proceeds most actively. In view of this fact, the writer concludes that repeated lavage to remove the alkaloids as fast as they are eliminated must certainly be a life-saving process, whether the poison has been taken by the mouth or hypodermically.

The washing should be practised at short intervals, and the sooner this can be done after the opium or morphine has been taken the better.

DIGITOXINE.

MASIUS (*Bulletin de l'Académie Royale de Médecin de Belgique*, No. 6, 1894) has employed digitoxine for more than a year in the treatment of cardiac diseases, pneumonia, and typhoid fever. He prescribes it in the dose of one-sixty-fourth of a grain, thrice daily, this amount being contained in two teaspoonfuls of a one-hundredth of a one-per-cent. solution in sweetened water and alcohol. His conclusions are as follows:

(1) Its action is prompt and decided, and rarely attended with any gastric disturbance.

(2) Its effect upon the circulation manifests itself within twelve or twenty-four hours by a lessening of the cyanosis and a marked improvement in the pulse and respiration.

(3) It soon induces diuresis, the daily quantity of urine sometimes reaching as much as four quarts, as the average, after the lapse of twenty-four hours. The effect of the remedy generally persists for eight to ten days.

(4) In pneumonia, its influence on the temperature is noticeable within twenty-four to forty-eight hours, and the good effect on the pulse is comparable to that observed in cardiac disease.

(5) In typhoid fever the drug also exerts a favorable influence upon the temperature and circulation.

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Hypodermic Use of Mercurials in Syphilis.

Howitz (*Therapeutic Gazette*, No. 5, 1894) concludes from a clinical study of the treatment of syphilis by the hypodermic method as follows:

(1) Hypodermic medication will not abort the disease.

(2) It should not be employed as a routine method.

(3) The production of abscesses and ptyalism must be rare.

(4) Injections of corrosive sublimate give rise to trifling pain, but not to callosities.

(5) The gray oil gives rise to slight pain and always produces induration.

(6) The gray oil is more dangerous than corrosive sublimate.

(7) In suitable cases, when properly employed, these remedies are among the strongest weapons wherewith to fight the disease.

(8) One-quarter of a grain of corrosive sublimate should be administered in each injection; if mercurials have already been employed, one-sixth of a grain.

(9) Corrosive sublimate is of undoubted value in lesions of the face and when a rapid impression is desired, likewise when important structures, as the brain or eye, are attacked. The hypodermic treatment is a substitute for inunction, of advantage when time is an object, in relapsing syphilis, in disease of the nervous system, in rebellious eruptions.

(10) The gray oil should be employed in severe secondary syphilis when there is evidence of a tendency to relapse; in nervous syphilis it is far superior to inunctions.

(11) This treatment is the most reliable and active that can be employed.

On the Use of Antipyrin in Large Doses.

McCall Anderson (*British Medical Journal*, December 1, 1894) believes antipyrin to be the most valuable of all the coal-tar derivatives. He has had no experience of its deleterious effects—at least of a serious nature—when employed with due precautions. In the opinion of its safety he is confirmed by the report of the Therapeutic Committee of the British Medical Association, which was as follows: "Out of 189 observers who report on antipyrin, no fewer than 138, or 73 per cent., have never observed any ill effects at all worth mentioning. Considering how large is the experience of the action of this drug represented in these reports, this large proportion of observers who have no ill effects to record is very remarkable. Almost more than any other fact could do, it seems to testify to the comparative harmlessness of this drug when properly administered. . . . It is clear, then, if one may be allowed to judge from these reports, that ill effects following the use of antipyrin are not only relatively but absolutely infrequent in their occurrence."

Three cases, one of hysterical fits and two of chorea, are cited as illustrating the good effects of antipyrin in large doses. According to the writer the initial dose should not exceed ten or, at most, fifteen grains, and when this amount is well borne it should be cautiously increased to forty or fifty grains thrice daily. The paper concludes with the following aphorisms:

(1) Antipyrin is not the dangerous drug which some observers have led us to suppose.

(2) It may be given in safety in large doses, even in the case of children, in most cases, although the initial dose must be small, and it must be slowly and cautiously increased, the patient always being carefully supervised.

(3) In large doses it often yields surprisingly good results, and in chorea it is the only medicine from which cures may confidently be anticipated.

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THE SERUM TREATMENT OF DIPHTHERIA.

In a discussion at the Munich Bezirksverein (*Münchener medicinische Wochenschrift*, November 6, 1894) BUCHNER observed that this serum, experimented with in various laboratories, had yielded excellent results, yet to prevent disappointment, caution is needed in drawing conclusions from the clinical experience. The antitoxin has great resisting powers against light, heat, etc. Von Ranke first referred to clinical investigations made in December, 1893, with a serum obtained from Behring. Of eight severe cases so treated seven died, and after death a form of lobular pneumonia was found. At first it was not quite obvious whether this pneumonia was to be connected with the treatment. In September and October, 1894, Aronson's serum was used. Among nine cases three died. In one case of severe septic diphtheria the serum produced no effect. In two severe cases no change was noted, perhaps because the serum was not used in sufficient quantities; one severe and four medium cases recovered without intubation. The author's impressions of this serum were favorable. Von Ranke then tried Behring's serum again. In twelve cases of severe diphtheria there was only one death, and that from the most severe septic form of the disease. The numbers are too small to base conclusions upon, but the investigations will be actively continued. The mortality from diphtheria has hitherto been terribly high. Seitz dealt with the preventive inoculation; two cubic centimetres of Behring serum No. 1 were used for this purpose. The duration of the protection conferred is not long. Septic diphtheria and other complications are no contra-indications to the use of the serum, but such processes cannot be expected to be influenced by it. Renal complications, paralysis, and laryngeal stenosis are rarer with the serum treatment.

OPPENHEIMER (*Ibid.*, October 23, 1894) records a case of septic diphtheria in a boy, aged 4½ years, treated without success with Behring's antitoxin. On the fifth day of the disease there was some dirty gray membrane on both tonsils, and the urine contained albumen. Six Pravaz syringefuls of Behring's antitoxin No. 11 were injected on that day. During the next few days the albuminuria increased. The general condition of the child underwent very little improvement until the fourteenth day, when the membrane had disappeared. The glands in the neck were much swollen and beginning to fluctuate. Quite suddenly death took place from cardiac paralysis. The author observes that not every case of diphtheria can be cured by the antitoxin, especially the most dreaded septic form. The antitoxin certainly did no harm. A sister of the above-named patient, aged 2½ years, who was injected with half a syringeful of the antitoxin, had not shown any signs of the disease.

VOSWINKLE (*Archives Kinderheilkunde*, Band XVII, Heft. V–VI, 1894) states that from January 20 to March 20 sixty children suffering with diphtheria were treated with the antitoxin. Of thirty severe cases 50 per cent. recovered. Of fifteen moderately severe cases 81 per cent. recovered. Fourteen had a mild form of the disease, and all recovered. Of the entire number 70 per cent. recovered. In 1890, in the same hospital, 55.7 per cent. of the cases of diphtheria recovered; in 1891, 55.6 per cent.; in 1892, 56.6 per cent.; in 1893, 51.7 per cent. Of twenty cases, in which tracheotomy was performed, 45 per cent. recovered. In 1893 only 26 per cent. of the tracheotomy cases recovered. No bad effects from the injections were observed.

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OBSTETRICS.

UNDER THE CHARGE OF

BARTON COOKE HIRST, M.D.,

ASSISTED BY

RICHARD C. NORRIS, M.D., AND FRANK W. TALLEY, M.D.

Conception in the Puerperium.

Gruber (*Der Frauenarzt*, July, 1894) reports a case which he had under his care last year of a woman, aged 38 years, who had borne children. She was under Gruber's care for abortion at the fourth month. Four months later she consulted him again in regard to her menses, which had not appeared since her miscarriage. Her abdomen had increased in size, and on the night before her visit she had felt the movements of the child. On examination a four months' pregnancy was diagnosed. Nine months after the abortion she gave birth to a fully-developed female child. Gruber refers to this as a case of conception during the puerperium.

Retroversion of the Gravid Womb.

Tarnier (*Journal des Sages-Femmes*, October 16, 1894) teaches that, as a rule, it is best to keep a pregnant woman with retroversion at rest. The urine should be drawn off with the catheter several times a day. The bladder, being thus constantly kept empty, no longer presses upon the uterus, which can rise up to its right position. In a clinical lecture Tarnier described an exceptional case. There was clearly retroversion, but no retention; in fact, the patient felt sharp pains, and constantly kept on passing urine. She was put under chloroform, and the uterus was reduced by the operator's two fingers passed into the vagina. Abortion was thus averted.

Symmetrical Perforation of the Labia Minora during Delivery.

Dr. Maygrier (*Journal de Médecin de Paris*, April 22, 1894) reports the following case: Patient, 24 years of age, II-para, having aborted at the fifth month, was seen in labor at term. The labia minora were large and triangular. The head of the child was expelled rather suddenly, and the perineum was found covered with blood. The child being delivered, the vulva was cleansed, when the perineum was found to be intact. On each side there was a tear in the labium minus large enough in the inner surface to admit the tip of the finger, and on the outer surface forming merely a slit. There was healthy tissue between the rupture and the vagina.

The production of the lesion was discussed by Maygrier as follows:

(1) Sécheyron has explained it as due to the stretching of the labia, and the giving way at their weakest part.

(2) Budin has shown that it may result from a continuation of a tear starting from the hymen. In Maygrier's case, where the rent was separated from the vaginal orifice by untorn tissue, the mechanism of production was probably that described by Sécheyron. Union does not take place well in these cases, because of the friableness of the tissues, and because their elasticity tends to keep the edges of the tear apart.

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Pregnancy after Ventro-fixation.

Löhlein (*Deutsche medicinische Wochenschrift*, March 15, 1894) reports two cases of pregnancy following ventro-fixation of the uterus.

The first patient was 30 years of age. The operation was performed in July, 1892, for prolapse. Parturition took place in December, 1893.

The second patient was 35 years of age. Myomectomy had been performed in November, 1892. The uterus was retrodisplaced; to remedy this the bed of the tumor was fixed to the abdominal wall. She became pregnant, but suffered from severe nausea and vomiting. The child was well developed, but died shortly after its birth. Löhlein considers that nausea and vomiting during the early months of pregnancy were severer in both patients than in previous pregnancies.

A Case of Quadruple Pregnancy.

Dr. Bousquet, of Marseilles (*Journal de Médecin de Paris*, May 27, 1894), described a rare event—the delivery of four children at a birth—before the Société Obstetrique et Gynécologie de Paris in April, 1894.

The patient, a primipara, aged 24 years, was pregnant at the eighth month. At this time she journeyed by rail from Nice to Marseilles, the jolting of the travel bringing on a premature labor. Dr. Bousquet was called. He found the abdomen very large, and with careful auscultation made out the presence of three fetal hearts, beating respectively at 122, 135, and 157 to the minute. Vaginal examination revealed two heads presenting in R. O. A. and R. O. P. The first came down and birth was hastened by forceps. On examining again, the other head had disappeared, and in its place, to his dismay, he found three feet. A right foot came down to the vulva, and he extracted. The second head had now engaged, so he ausculted again, and heard two distinct hearts, at 122 and 157 beats to the minute. The third child was born quickly, and immediately a heel came down. This was the fourth child. He at once gave a hypodermic injection of ergotin; in twenty minutes a large placental mass was expelled, comprising four placentæ united by their borders, but with apparently only a single compartment in the membranes. An intra-uterine douche was given. The puerperium was normal, and with the help of three wet-nurses, the mother was able to nourish the four children, who, from recent information, were all doing well.

The Etiology of Puerperal Fever.

Herman (*Public Health*, Vol. vi, No. 9, June, 1894), in a discussion of puerperal fever, combated the terms heterogenetic and autogenetic, made classical by Robert Barnes, maintaining that this classification was delusive, because "(1) This so-called distinction, if it can be made, in no way affects prognosis or treatment; (2) if there be such a thing as self-infection with septic poison, we cannot in any way distinguish a self-infected case from one not so arising; (3) all our present knowledge goes to show that when antiseptics are efficiently used no such thing as self-infection occurs."

He refers to the cases thought to be of self-infection by Semmelweiss as simply cases in which the patients were inoculated with septic poison because the very rough antiseptic measures introduced by him failed.

He alludes to certain cases of autogenetic puerperal fever, some of which are

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conditions capable of producing slight febrile symptoms. These exist equally in hospitals in which antiseptics are used and outside them. When antiseptics are used the illnesses they produce are trivial, so that no one could apply to them the terrible name of puerperal fever.

These causes he cites under the heads of: (1) Errors of diet, (2) malaria, (3) chills, (4) bad hygienic surroundings, (5) emotion, (6) strumous diathesis, (7) the effects of sewer-gas.

The theory that sewer-gas may produce an illness like septicemia rests, he states, upon one kind of evidence alone,—viz., that of isolated cases which seem to be septic, but were thought not to be because the physician who reported the case could not discover a definite source from which septic poison might have been carried to the patient, but did find some drainage defect. The fact that the source of septic infection was not found does not disprove its existence. Herman considers these cases to have been simply septicemia in which the source of infection was not found.

Herman states that there is no report, to his knowledge, as to the course of a number of lying-in women delivered where sewer stinks were present, but defended by antiseptics from septic poisoning. Until this is produced, opinions as to the effects of sewer gas on the lying-in can only be speculative. He concludes by stating that puerperal fever is one of several morbid conditions which, in the absence of knowledge, have been ascribed to defective drainage.

From his remarks the following may be deduced:

(1) Puerperal fever is produced by micro-organisms which get into the system through wounds made in childbirth.

(2) These organisms are transferred by contact. They are not inhaled or swallowed.

(3) The transferrence of organisms is prevented by cleanliness and the organisms are killed by antiseptics.

(4) The hands are the usual poison-bearers; next in frequency clothes and instruments.

(5) Investigation of a particular outbreak of puerperal fever should begin with inquiry into the precautions taken by doctors, nurses, and midwives to secure the cleanliness and disinfection of their hands, clothes, and instruments.

(6) There is no such thing as self-infection with puerperal fever. The causes supposed to produce "autogenetic" puerperal fever produce, in lying-in women defended by antiseptics from septic poison, only trivial illnesses.

(7) The inhalation of sewer gas causes in the puerperal woman the same symptoms as in other persons. There is no good evidence that, in women defended by antiseptics from septic poisoning, it produces symptoms like those of septicemia.

(8) The poison of erysipelas of the skin produces in lying-in women erysipelas of the skin, and no other illness. But the poison of the disease known as phlegmonous erysipelas of cellular tissue produces puerperal fever.

(9) The poison of scarlet fever produces in lying-in women scarlet fever and no other illness.

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GYNECOLOGY.

UNDER THE CHARGE OF

CHARLES BINGHAM PENROSE, M.D.,

ASSISTED BY

WILLIAM A. CAREY, M.D., AND H. D. BEYEA, M.D.

PERINEO-COLPO-RECTO-MYOMECTOMY.

At the Eleventh International Medical Congress, PROFESSOR PÉAN proposed a new method for the removal of certain myomata which cannot be removed by either the vaginal or the abdominal method. He uses the transperineal recto-vaginal course to remove such growths as are situated behind the uterus and have pushed through the recto-vaginal septum and taken a downward direction towards the perineum. In operating, the perineum is incised up to the peritoneum and the tumor is extirpated. Péan uses his own hemostatic forceps to control the bleeding, fills the resulting cavity with sponges made secure by a strong cord, first inserting a tube through which antiseptic injections are given, and then sutures the perineum by means of a needle mounted on a holder. Péan has used this method for the removal of carcinomata situated high up in the vagina or on the anterior wall of the rectum. In his opinion it is better in some cases to take the ischio-rectal course than the sacral.

EXTIRPATION OF THE UTERUS FOR DISEASE OF THE ADNEXA.

BALDY (*American Journal of Obstetrics*, July, 1894) claims that if the mortality of hysterectomy is not greater than that of double ovariotomy the former operation should be preferred in the majority of cases of pelvic inflammatory diseases. It is not urged that this rule be applied to all cases, for it happens that occasionally the position and condition of the uterus are very favorable to drainage, and the original infection may thus be removed and the uterus become restored, in great measure, to a healthy condition. Such cases contra-indicate the removal of the uterus. But from the fact that the majority of cases of disease of the appendages follow the invasions of the uterine tissues, and the fact that after removal of the appendages disease often lingers in the uterus and thus prevents a cure, it is wise to extend the operation to a hysterectomy if we desire a complete removal of the diseased structures. If, as is contended, 20 per cent. of the cases of pyosalpinx are due to tubercular infection, it is surely good surgery to remove the uterus as well as the appendages, from the fear that the uterus is also affected. When the womb is greatly enlarged, infiltrated, or diseased, it is a proper subject for removal. When there is any good reason to expect that the uterus will in future become the seat of disease, it may with propriety be extirpated. The author has had twenty-two operations of this kind in this class of cases, and all recovered from the operation and the great majority have been cured. Four cases upon whom the operation of double ovariotomy had been performed had continued to suffer quite as much as before the operation, despite the fact that local treatment was given the uterus. Each of these cases subsequently had the uterus removed, with complete cessation of the symptoms. In all cases it is, of course, assumed that both ovaries must by reason of the location and extent of the disease be sacrificed. Except in the

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presence of malignant or tubercular disease, the womb must not be disturbed if even a portion of one ovary and a tube can be preserved. Nor even should the operation be extended to a hysterectomy when double ovariotomy will even temporarily answer the purpose, should the patient be in such condition that the prolonged manipulation might render the result of a given case doubtful. The abdominal method of performing hysterectomy is advocated, for the following reasons. All of the parts may be completely exposed to the eye and touch. All intestinal lesions may be readily detected and repaired. The adnexa may be completely removed together with the uterus. All wounds may be closed, denuded surfaces may often be covered with peritoneum, and in many cases drainage may be avoided.

American surgeons have by this method kept the mortality somewhat lower than the French have kept the mortality by the vaginal method. The only possible condition in which the latter method may be preferable is in those cases where there is a large pelvic abscess accompanied with dense and extensive intestinal adhesions which it would be impossible or highly dangerous to the intestines to separate. The relations existing between the cervix and the vagina need not be disturbed in the operation of hysterectomy, and yet the uterus can be removed practically in its entirety; therefore it is unnecessary to fear a weakening of the vaginal result.

Treatment of Vaginitis.

Lutand (*Annals of Gynecology and Pediatry*, July, 1894) abstracts an article (*Revue Obstétricale et Gynécologique*) in which the author urges a careful distinction to be made between the acute and chronic stages of the affection, although very little difference exists in the treatment of the simpler and specific forms of the disease.

In the acute stage the speculum should be avoided, the patient kept as quiet as possible, and walking, coitus, and all physical exercise forbidden. Esmarch's douche with two litres of a 1-per-cent. solution of boric acid should be injected about every six hours. Emollient injections, such as starch, flax-seed meal, or decoction of poppy-heads, are also useful.

In cases of severe pain a suppository of opium may be given at bedtime. Bladder symptoms are relieved by poultices sprinkled with laudanum; bromides, emollient drinks, and alkaline diuretics are prescribed.

Wine is not to be used, but weak tea may be drunk.

For the chronic stage the following injections are recommended to be used three times daily:

℞ Acidi carbolici . . . . . gms. v.
Alcoholis . . . . . gms. x.
Ess. thym. . . . . gtt. xx. M.
Sig. For two quarts of water.

℞ Hydrarg. bichloridi . . . . . ctgms. xxv.
Acidi tartarici . . . . . gm. i. M.
Sig. For two litres of water.

℞ Potass. permangan. . . . . gms. x.
Aquæ dest. . . . . gms. cc. M.
Sig. A tablespoonful for two quarts of water.

This last injection is the best remedy for gonorrheal vaginitis, but it soils linen. In rebellious cases or when it is necessary to act rapidly, a speculum is intro-

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duced and the vagina is painted with a solution of silver nitrate (two grammes in thirty grammes of water).

Before withdrawing the speculum, a large tampon saturated with the following is introduced:

℞ Acidi tannici . . . . . gms. ii.
Cocain. hydroch. . . . . ctgms. x.
Glycerini . . . . . gms. cxx. M.

This tampon should be left in position two days.

Separation of the walls of the vagina by the introduction of tampons of iodoform or salol gauze hastens the cure of every case.

A TUBERCULAR OVARIAN CYST AND TUBERCULAR UTERINE POLYP.

MADLENER (*Centralblatt für Gynäkologie*, No. 22, 1894) reviews the literature and reports a case of tubercular ovarian cyst associated with a tubercular intra-uterine polyp. Virchow believed that tuberculosis of the ovary was an almost impossible condition, and that, should it occur, it would be indistinct and not demonstrable. In recent literature, however, an indistinct form of tuberculosis of the ovary has frequently been mentioned, demonstrated by minute areas of caseation; and also, but very rarely, tubercular ovarian cysts have been described. Of the latter there are two distinct forms.

(1) Those in which the cyst is a primary, uncomplicated, proliferating ovarian cyst, the peritoneum and wall of which are infiltrated with secondary miliary tubercles. Of this form three cases have been reported (Spencer Wells, Baumgarten, and Sanger).

(2) Those in which the external surface is smooth, and does not differ from the ordinary ovarian cyst, but the contents is composed of pus and caseous material.

The inner surface of the cyst wall is lined with tubercles and caseous masses. It appears as a large tubercle in the ovarian substance, the centre of which has undergone caseation and liquefaction; therefore, it increases in size through tubercular destruction of its walls. No signs of inflammation can be seen in this form. One case has not been reported by Heiberg. The cyst had reached the size of a fetal head, and contained material much resembling pus. The writer believes this case should have been described as an abscess. Madlener's case, which much resembles the last form, is as follows: On making a post-mortem upon the body of a woman dying of phthisis, a smooth, movable cyst the size of an adult head was found growing from the right ovarian region. On opening the cyst it was unilocular, and contained a thin yellowish-green fluid. Small masses or flakes of tubercular matter were frequently seen floating in this fluid. The inner surface was completely covered with a layer of caseation tissue. Microscopic sections made through the cyst wall showed it to be composed of an inner layer of caseation material, a central layer of miliary tubercles containing giant cells, and an outer layer of tissue extensively infiltrated with small, round cells. No tubercle bacilli could be found. This case is also of much interest in that an adenomatous intra-uterine polyp was found at the fundus of the uterus, which microscopically was shown to be infiltrated with miliary tubercles containing giant cells and tubercle bacilli. Only one instance of tubercular intra-uterine polyp has been reported. The uterine mucous membrane showed interstitial and glandular endometritis, but no tubercles could be demonstrated. In the uterine wall opposite to the attachment of the polyp, and in relation with the cyst, was an area of case-

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ation. It was therefore believed that the polyp was infected secondarily from the cyst. The left ovary was normal, but both tubes were the seat of tubercular pyosalpinx. The writer believes that the cyst in his case was of the tubo-ovarian variety, and that infection primarily took place in the tubes.

Treatment of the Pedicle after Myomectomy.

Mangiagolli (Transactions of the Eleventh International Medical Congress, *American Journal of Obstetrics*, August, 1894) stated that the importance of the treatment of the pedicle in the prognosis of hystero-myomectomy has been greatly exaggerated.

Statistics show that the mortality of the operation is progressively decreasing, whatever the method used, and that each method claims magnificent results. There are conditions, both general and local, which are deserving of more attention than the treatment of the pedicle. Among these may be mentioned, as of prime importance, the intraligamentous development of the tumor, which increases the gravity of the prognosis in proportion to the volume of the tumor. In a consideration of the results obtained by the various methods it is essential to make a distinction between fibromata which develop within the ligaments and the other varieties of fibroma,—subserous, submucous, and interstitial. In this second class the mortality in about 5 per cent. by both methods, and it is not likely that this prognosis would be improved by total ablation, whether abdominal or abdominal-vaginal. In the majority of cases the endoperitoneal method is the one to be preferred, as it has been proved that a lower death-rate is obtained with an avoidance of some of the drawbacks of the extraperitoneal method. As a rule, preference is to be given to Zweifel's method, because of its simplicity and rapidity. Intraligamentous fibromata show a high mortality, and the question of the method to be used is of importance. Total ablation by the abdominal method might be valuable. During the past six years the author had performed eighty hystero-myomectomies, using all methods, and had a mortality of 13.7 per cent.

A paper by Martin on the same subject stated that in 1888 he decided to do away with the pedicle, as it was a source of hemorrhage and infection, and he therefore substituted total ablation of the uterus for supravaginal amputation. He began by total extirpation of the uterus by the abdominal method. At first he left a drainage-tube in the peritoneal cavity, and had a mortality of over 30 per cent.; after suppressing drainage the mortality fell to about 9 per cent.; finally, in a later series of cases it dropped to 3.84 per cent., due to the following procedures: (*a*) scraping and disinfection of the vagina and uterine cavity; (*b*) laparotomy; (*c*) uplifting uterus; (*d*) ligature and section of the broad and round ligaments to the cervix; (*e*) opening of the posterior fornix; (*f*) suture of the vagino-peritoneal border; (*g*) excision all around cervix and completion of suture; (*h*) placing of threads of suture in the vagina, and closure of peritoneum. In this way Martin operated upon twenty-six women and cured twenty-five.

Bantock reported twenty-three cases performed by the extraperitoneal method of treating the pedicle, with only one death.

Zweifel's clinic furnished a record of ninety-three cases with a mortality of 3 per cent. Other operators from different parts of the country reported their results with different methods of operating, and the sum of the evidence clearly pointed to the encouraging fact that, whatever the method employed, the result secured is improving each year. Five years ago the mortality (no matter what the method used) was about 25 per cent., whereas now it is 5 per cent., or even lower with certain operators.

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PATHOLOGY.

UNDER THE CHARGE OF

JOHN GUITÉRAS, M.D.,

ASSISTED BY

JOSEPH McFARLAND, M.D.

THE STAINING OF THE FLAGELLÆ OF BACTERIA.

BUNGE (*Fortschritte der Medicin*, Bd. XII, 1894, No. 12) suggests a method of staining flagellæ, which seems much more simple than that of Lœffler. The mordant employed is a mixture of three parts of a concentrated aqueous tannin solution to one part of a 1 : 20 aqueous dilution of liquor ferri sesquichloridi. To ten parts of this mixture one part of a concentrated aqueous fuchsin solution is added. This mordant need not be prepared fresh daily, as it seems to improve with age. With the solution thus prepared Bunge was able to demonstrate the flagellæ of proteus, bacillus coli communis, typhoid, and cholera without difficulty, and without the addition of any such acid or alkali solution as is necessary in Lœffler's method.

The bacteria are very carefully fixed to the glass and then stained for about five minutes with the filtered mordant, warming a little towards the end. Afterwards the mordant is carefully washed off, the specimen dried, and then stained with warm carbol-fuchsin.

OBSERVATIONS ON THE RÔLE OF LEUCOCYTES AND GIANT CELLS IN EPITHELIOMA OF THE TONGUE.

DUENSCHMANN (*Journal of Pathology and Bacteriology*, 1894, Vol. III, No. 1, p. 118) studied four epitheliomata of the tongue and two of the lip.

The technique is carefully described, serial sections embedded in paraffin being employed. The particular views of the writer are epitomized as follows:

Leucocytes are first seen at the periphery of the cell-nests; then they seem to enter the interior of the nest. The epithelial cells at this latter place disappear, the following stages being easily observed. I think this may be interpreted as a resorption of the epithelial cells by leucocytes. Usually it is the central cell which first undergoes this fate. It seems justifiable to conclude that the penetration of the leucocytes takes place from the periphery to the centre. It sometimes seems that the leucocytes grow into the epithelial plug by resorbing its innermost part. Whole cell-nests seem to disappear by the action of leucocytes alone. But, so far as my observations go, this does not seem to be the common process, another histological element—the giant cell—usually coming into action. A cell-nest may be seen with only one giant cell at the periphery, in another there may be two or three at work, either in the periphery or more towards the centre of the cell-nest, in a third four or five and more, and so on, until finally a whole cell-nest, more or less recognizable as such by its contour, may be almost replaced by giant cells; the function of the giant cells, then, it does not seem improbable, is the same as that of the leucocytes,—to resorb the epithelial cells. The writer also thinks they resorb leucocytes, because leucocytes are often found in them.

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Immunity and Immunizing.

Buchner (*Centralblatt für Bakteriologie und Parasitenkunde*, October 26, 1894, Vol. xvi, No. 18, p. 738) and his fellow-workers injected sterile emulsions of wheat gluten into the pleural cavities of dogs and rabbits, and obtained an exudate free of bacteria, but rich in leucocytes. This was more powerfully bactericidal than the blood or serum of the animals under observation. Inasmuch, however, as phagocytosis was a commonly-observed phenomenon in the exudate, it became a question whether the destruction of the bacteria was due to it or to substances contained in the liquid. This question, of course, could not be answered simply by the microscope. It occurred to Buchner that freezing would destroy the vitality of the leucocytes, probably without injuring the bactericidal properties of the serum, and the subsequently thawed serum would show whether the destruction of the bacteria was due to the serum or to the cells. The experiment was performed, and the bactericidal alexine uninjured, while the leucocytes were killed. The serum after thawing was found to be just as powerfully, if not more powerfully, germicidal than the unaltered exudate.

Epithelial Changes produced by Irritation.

D'Arcy Powers (*Journal of Pathology and Bacteriology*, Vol. iii, No. 1, November, 1894, p. 124) thought the implantation of cancer into the eye might be more successful in producing a neoplasm if the eye were chronically inflamed previously. For this he performed paracentesis corneæ upon a healthy guinea-pig, and a piece of the bulbous end of a vibrissa was pushed into its anterior chamber. In three days the cornea was cloudy, and there was a slight circumferential zone of inflammation. At the end of a week the eye was clear, and the vibrissa could be seen lying on the anterior surface of the iris. Later, the cornea became hazy, and small blood-vessels ran into it from the conjunctiva. The animal was killed, the eye excised, and conserved in Foà's solution.

A variety of changes was observed in the epithelium of the conjunctiva; these, together with numerous appearances from corneal implantations of the vagina, are well shown in a series of micro-photographs.

Many of the bodies enclosed in the cells figured resemble what have been described by various observers as protozoa, but are explained as appearances due to cellular degeneration, to phagocytosis, and to the entrance of leucocytes into the cells, where they may be digested or may degenerate. Occasional red blood-corpuscles are also described as present in the cells.

Attention is directed to the resemblances existing between the described malarial parasites and the bodies found in the irritated cells.

The writer concludes that our present state of knowledge is insufficient to enable us to discuss the problem of the microbic nature of cancer, and that all our endeavors should be first to acquire a thorough knowledge of the peculiarities of the epithelial cells.

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DERMATOLOGY.

UNDER THE CHARGE OF

LOUIS A. DUHRING, M.D.,

ASSISTED BY

M. B. HARTZELL, M.D.

PSORIASIS AND ASTHMA.

HÖLSCHER (*Monats. für Prak. Derm.*, Bd. XVII, 9) gives the notes of four cases in which psoriasis and asthma occurred conjointly. In some cases asthma appeared with the eruption of psoriasis and ceased as the latter vanished; in other cases the asthma preceded the psoriasis and disappeared as the eruption developed.

A MODE OF TREATING XANTHOMA MULTIPLEX.

LESLIE ROBERTS, of Liverpool (*British Journal of Dermatology*, May, 1894), in a case of this disease occupying the palms and fingers, obtained satisfactory results from the two following formulæ, employed over a period of months. At first, salicylic acid, ʒi; liquor epispasticus, ♏xv; ol. ricinum, ʒi; and acetic ether, ad ℥ii, were applied; and subsequently, salicylic acid, ʒi; chrysarobin, ʒss; ol. ricinum, ʒss; flexible collodion, ad ℥i.

LUPUS VULGARIS TREATED WITH THYROID EXTRACT.

BYRON BRAMWELL (*British Medical Journal*, April 14, 1894) presents two marked cases of lupus vulgaris of the face treated with benefit by the long-continued use (for months) of thyroid extract. The improvement (as shown by the series of photographs) was positive. No local remedies were used, not even washing having been permitted. The dose of the thyroid extract was moderate rather than large,—two or three tabloids *per diem*. The use of the remedy is recommended, together with appropriate local treatment.

ON PERSISTENT ERYTHEMA AND ITS TREATMENT.

J. F. PAYNE (*British Journal of Dermatology*, May, 1894) considers a number of cases that had been under observation, and first differentiates them from possible forms of eczema and lupus erythematosus. The majority of them agree with erythème scarlatiniforme of French writers, the chief character of which is bright redness with desquamation. Burning and sensations of pain (in addition to itching) are also conspicuous features. They are always symmetrical, but in other respects depart widely from the definition of erythema as a necessarily transient, or at most recurrent, affection, as put down in most English books.

Payne is of the opinion, from his experience with this class of cases, that nearly all may be treated successfully by drugs, and especially quinine and sodium salicylate, the former in five-grain doses, so that twenty or thirty grains may be taken daily. It is the more valuable of the two drugs. Lead lotion, kept on continuously, is probably the most effective local remedy, to which may be added a little glycerin to moderate, but not arrest, evaporation.

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The Tuberculous Nature of Erythematous Lupus.

Audry reports (*Journal des Maladies Cutanées et Syphilitiques*, No. 8, 1894) a case of disseminated erythematous lupus of the face and limbs associated with pulmonary tuberculosis, in which microscopical examination of the skin lesions showed well-characterized tuberculous infiltrates in the derma. Bacilli were looked for, but were not found. The author concludes from the results of the examination of this case that there are cases of true erythematous lupus, which are of tuberculous origin, and are tuberculous themselves.

Resorbin.

Hahn (*Monatsheft für Praktische Dermatologie*, Bd. xix, No. 2, 1894), experimenting with this ointment base, obtained better results than he had formerly got with the older ointments. In all seborrheic conditions the skin bore it well, although some of his patients complained of burning and tension; in these, however, a weaker ointment did not produce this. Especially good results were obtained in two cases of pruritus vulvæ with secondary eczema in old women, after other ointments had failed to give relief. The author thinks, however, that the chief importance of this new base is in facilitating and improving the therapy of syphilis. Inunctions with mercurial ointment prepared with this base gave unusually good results, the symptoms disappearing quickly.

Relative Frequency of Fibroids in Dark-skinned Races.

Edward A. Balloch (*Medical News*, January 13, 1894) directs attention to this subject, and concludes that the dark-skinned races differ from the white race anatomically, physiologically, and pathologically; and that elephantiasis, keloid, and uterine myomata are the three diseases most characteristic of those races. They are all mesoblastic growths, their essential feature being an increased development of fibrous tissue, due to proliferation of cells around the capillaries, constituting true inflammatory sclerosis. In respect to malignant growths, the same connective-tissue type predominates. This peculiarity in the dark-skinned races may be regarded in the light of a pathological law not heretofore sufficiently recognized.

Erythema after Three Successive Deliveries.

Gaertig (*British Medical Journal*, September 22, 1894, from *Centralblatt für Gynäkologie*, No. 30, 1894) reports a case in which a severe erythema occurred in the same patient in three successive labors. In the first confinement there was adherent placenta and severe post-partum hemorrhage. On the third day an erythematous rash appeared, beginning on the abdomen, and spreading thence to the extremities. Neither sore throat, albuminuria, nor fever was present. The itching was extreme. In the second confinement there was severe flooding and adherent placenta as before; on the following night the rash appeared, this time accompanied by high temperature, but without sore throat or albuminuria. The eruption extended over the whole body, vesicles forming at some points; recovery was slow. In the third confinement post-partum hemorrhage and adherent placenta were again present, and on the second day erythema appeared, beginning, as before, on the abdomen and spreading to the extremities. In this attack there was no fever.

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The Function of the Sweat-Glands in Man.

In a paper (*British Journal of Dermatology*, September, 1894) read in the Dermatological Section at the annual meeting of the British Medical Association, August, 1894, Unna again expressed his well-known views concerning the function of the sweat-glands, considering in particular the objections urged by Beatty. The author concludes his paper with the statement that he is convinced it is "irrefutable that the sweat-glands in man secrete fat, which at any time can be proved both on sections of the skin and in the sweat of the hand, by means of treatment by osmic acid,—a fat which, though similar to that of the sebaceous glands, is different from it as stearic acid and margaric acid are from oleic acid."

A Case of so-called Erythema Elevatum Diatinum.

Fred. J. Smith, of London (*British Journal of Dermatology*, May, 1894), describes a case of this new and interesting disease, to which Crocker recently first directed attention. The lesions were on the right and left upper extremity, and occurred in a young lady of 18 years, and were preceded by rheumatic pains in the arms, which had continued more or less up to date. Except that she was rather anemic, there was no apparent disease besides the local affection. The cutaneous disease had begun a year or more before each "lump," beginning as a white spot which gradually thickened and enlarged. The lesions were nodules and plaques, raised about one-twelfth of an inch above the level of the surrounding skin, were firm, blue, and congested, and freely movable, with the skin over the subjacent structures, and was circular or oval. Under the microscope absolutely nothing was to be seen except densely-matted fibrous tissue, with but few cells or nuclei.

The differential diagnosis is between sarcomata, fatty tumors and fibrous nodules of rheumatism. Dr. Smith is of the opinion that the disease is not described in text-books, but that it most nearly resembles the disease described by Dr. Bung, of Manchester, in *Illustrated Medical News*, May 18, 1889.

Erythemata Occurring in the Course of Tuberculosis.

Bayet reports (*Journal des Maladies Cutanées et Syphilitiques*, No. 6, 1894) two cases of erythema occurring in tuberculous patients, the result, as the author believes, of toxines produced by the tubercle bacillus.

The first case occurred in a woman, 47 years of age, the subject of pulmonary tuberculosis. The eruption was most marked upon the back, the belly, the legs, and forearms, and consisted of isolated erythematous coin-sized spots separated from one another by sound skin, the new lesions being of a vinous red while the older ones were brownish, the whole resembling a syphilitic roseola. The eruption remained stationary for eight days, when it began to pale, leaving a slight brownish coloration.

The second case was that of a young man with a lupus of the face of great extent and slight symptoms of pulmonary tuberculosis. Suddenly, while under treatment by cauterization, he was taken with an acute tuberculous outbreak, which manifested itself by enteritis, bronchitis, and a possible meningitis. At the same time the forearms became the seat of an erythematous eruption precisely similar to that observed in the first case reported.

The patient had not taken any medicines before the appearance of the exanthem.

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The Nature and Treatment of Leprosy.

In a paper which was awarded the Alvarenga prize for 1892 by the College of Physicians of Philadelphia (*American Journal of the Medical Sciences*, November, 1894), Bibb concludes:

(1) That leprosy is a specific disease, due to the presence of the lepra bacilli.

(2) That leprosy is influenced by race, climate, soil, food, etc., only in so far as these tend to enervation on the one hand, or to physical well-being on the other.

(3) That experiments have not demonstrated leprosy to be inoculable on man or beast.

(4) That leprosy is hereditary.

(5) That leprosy is contagious, infectious, and communicable, under conditions not yet understood.

(6) That leprosy is both mitigable and curable.

(7) That chaulmoogra oil is a drug of unquestionable value in the treatment of leprosy.

(8) That leprosy may be completely eradicated from the list of human ills.

The Etiology and Treatment of Acne Vulgaris.

In a paper (*British Medical Journal*, September 29, 1894) read before the Section of Dermatology of the British Medical Association, Mackenzie expresses the opinion that acne is a local disease influenced little or not at all by constitutional conditions. The essential cause is held to be obstruction of the ducts of the sebaceous glands brought about by perversion of the normal and physiological development of the hair and gland structures, especially apt to occur about the time of puberty. Exposure, dust, and dirt act as intensifying causes. Suppuration, which is so frequent an accompaniment of the disease, is due to the entrance of the pus coccus into the mouths of the follicles. Local preventive treatment must keep in view three objects:

(1) To remove the superfluous seborrheic secretion, and exercise a dermatolytic action on the epidermic accumulations in and at the mouths of the sebaceous ducts.

(2) To stimulate the sebaceous glands into healthy activity.

(3) To keep the skin aseptic, and thus prevent the pus cocci from gaining admission to the mouths of the follicles.

The medicated soaps devised by Eichhoff, at the suggestion of Unna, are effective remedies for accomplishing these results. In the soap treatment all the conditions necessary for the prevention of acne are fulfilled.

In the treatment of the lesions of acne all comedones should be expressed. The medicated soaps above mentioned are also of great value, using the milder superfatted soaps of menthol or menthol-eucalyptol when the skin is irritable or inflamed. All pustules should be opened. For the relief of inflammation soothing applications must be employed, using ointments at night and lotions in the daytime. Ointments of zinc, of glycerin, of subacetate of lead, of boric acid may be applied at night, and calamine lotion used in the daytime. When the inflammation is slight, stimulating ointments, such as sulphur, may be used. Belladonna is also of service in some cases. The author has not derived any benefit from the internal use of the sulphide of calcium, so much lauded by some, and he has discontinued it. Finally, local measures are relied upon entirely for the treatment and prevention of the disease.

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Some Parasitic Dermatoses met with in Man.

Majacchi, the well-known dermatologist of Bologna (*British Journal of Dermatology*, May, 1894), discusses oxyuris cutanea, prurigo dermanyssica, trichophytosis palmaris, plantaris, and auricularis.

Oxyuris cutanea is a dermatosis confined to the anal, perineal, and inguinocrural regions, and assumes the form of an erythema or eczema intertrigo. It may be described as existing in two stages: first, the emigration period, during which the oxyurides convert the skin into a suitable nidus; second, the period of acclimatization, when they take up their abode, nourishing themselves, and depositing their eggs on the skin. The disease is rare, and is met with in infancy as well as in adult life. Enemas containing ½ to 1 per cent. of salicylic acid, a tansy lotion, and cod-liver oil internally are recommended.

Prurigo dermanyssica (or, better, pruritus a dermanyssis) is characterized by a multiform eruption. The mite, of the order arachnidæ infesting fowls and horses, is usually transient, but may live in the clothes and feed on the skin.

Majocchi refers to thirty-two cases of trichophytosis palmaris and ten of plantaris that have been recorded, and gives the notes of two personally-observed cases. In the septa of the vesicles he found hyphæ ramifying in all directions. He regards it as probable that different varieties of the fungus give rise to different clinical forms of disease.

Seborrhea.

Wallace Beatty, in a paper read before the Dublin Biological Club (*British Journal of Dermatology*, June, 1894), considers the pathology of seborrhea, and discusses at length the well-known views of Unna concerning this disease. While recognizing the accuracy of this author's clinical observations he takes issue with him upon the pathology of so-called seborrheic eczema, and asks the following questions:

(1) Is the oily seborrhea really a hypersecretion from the sweat-glands?

(2) Is the vernix caseosa also a product of a true hypersecretion from the sweat-glands mixed up with exfoliated epidermis?

(3) Is every case of seborrhea (excepting the oily form and the vernix caseosa) truly an inflammatory affection and one involving, in the main, the sweat-glands?

(4) In particular, is this the case with so-called dandruff, the pityriasis capitis of some authors?

The first and second of these questions the author answers in the negative.

In considering the third question, the fact that fatty crusts are frequently seen covering a perfectly pale skin, which gradually merges into a reddened and inflamed skin, is taken as a strong point in favor of Unna's view; but the author's own observations do not lead him to believe that the sweat-glands, even if increased in number, secrete fat.

In answering the last question, the results of the examination of the scalp of a woman, which had been the seat of a long-standing seborrhea, are given. The portion of skin examined showed numerous bed-hairs; atrophied follicles; no sign of fibrous change round the fundus of the follicles; excessive formation of horny matter in some hair-follicles; some signs of inflammation, but only slight; micro-organisms on the surface of the epidermis, and extending into the mouth of the follicles and sweat-ducts; large sebaceous glands, well blackened with osmic acid; no sign of blackening of sweat-glands or ducts; no evidence of multiplication of sweat-glands.

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MISCELLANEOUS.

THE WISTAR BIOLOGICAL SOCIETY.

A MEETING of the Wistar Biological Society was held at the Wistar Institute on December 7, 1894. Papers on the subject of "Water Filtration" were read by Dr. A. C. Abbott and Dr. Henry Leffmann, and remarks were made by Dr. William Pepper, Select-Councilman Byram, and others. Representatives from the Civic Club, the Women's Health Protective Association, and the College of Physicians were present.

Dr. Abbott discussed the subject of natural filtration. He spoke of the various bacteria found in surface waters, and said that, owing to percolation through the soil, deep soil waters are usually found poor in bacteria and not infrequently sterile. Bacterial life diminishes with the depth below the surface, and in virgin soil ceases entirely at about six feet.

Speaking of the attempts to imitate nature in this regard, he said the time had long past when filtration should be considered as in the experimental stage. He asserted that in the near future all large cities would supply filtered water for domestic purposes. By means of small glass model filters and tubes he showed the processes of natural filtration by sand and gravel, and demonstrated that the muddiest water could be made clear by simple percolation. He spoke of the results of some well-known large filtration plants, and referred to the following table, which was hung upon the wall:

SAND FILTRATION OF WATER,—BACTERIA PER CUBIC CENTIMETRE.

	Before.	After.	Reduction. Per Cent.
London, the Lea	954	12.5	98.7
" the Thames	1,886	21.2	98.9
Lawrence	10,900	264.0	97.6
Poughkeepsie	1,368	48.0	96.5
Calcutta	60,000	133.0	99.8
Berlin	35,760	198.0	99.4
Hamburg	5,021	21.5	99.6
Stettin	10,141	372.0	96.4
Copenhagen	705	35.0	95.1
Warsaw	25,500	30.0	99.8

The lecturer claimed that natural filtration is just as efficient in arresting pathogenic organisms as it is in removing the ordinary species from the water, asserting "in support of this opinion, we have only to cite the relative proportion of cases and deaths from cholera in Ham-

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burg and Altona during the epidemic of 1892." Both got their water from the same source, he explained, but the Altona supply was filtered. Hamburg, with a population of 640,000, had 16,957 cases and 8606 deaths, while Altona, with 148,615 population, had 516 cases and 316 deaths. In Hamburg the proportion of cases was 264.8 to every 10,000 persons, and in Altona only 34.6, many of which resulted from drinking the unfiltered water of the former place. By means of a map of the infected district, the locations of the centres of the disease were shown, proving that nearly all the Altona cases had been imported from Hamburg.

Dr. Abbott, by means of a couple of glass tubes, showed how much more quickly water percolated through gravel and sand than soil taken from the neighborhood of the Wistar Institute. The plan of natural filtration he found was hardly possible in Philadelphia. A number of glass plates were exhibited, showing the difference between the colonization of bacteria from unfiltered and filtered water. The unfiltered water covered the plates with bacterial colonies, while the other scarcely left any traces of bacteria.

In conclusion, he spoke of the death-rate from typhoid fever in this city as compared with other places. Here it is 6.31 per 10,000, Boston, New York, Baltimore, Berlin, Paris, and Washington all being lower, Berlin only showing 2.08. Lawrence, Mass., reduced its death-rate of 12.7 from typhoid fever to 5.02 by the introduction of filtration. London reduced its rate 70 per cent., and Munich 94 per cent. "In short," he concluded, "the cities that are supplied with pure water are those in which the typhoid death-rate is lowest; and it is safe to predict that, if proper steps be taken by this municipality, we shall be able to demonstrate a reduction in the annual mortality from this disease that will exceed the most sanguine expectations."

Dr. Leffmann spoke of the purification of water by chemical means. He said that the main object of this method was to economize time and space; to permit the employment of filter-basins of smaller area than those required for simple sand filtration, and also to diminish the frequency and extent of filter-cleaning. In the chemical treatment of waters intended for drinking purposes, the amount of precipitate is usually small, and the main object is to facilitate subsequent filtration. The most extensively used method is that in which some aluminum compound is employed. This is generally aluminum sulphate. When aluminum compounds are introduced into ordinary natural waters a reaction takes place with the carbonates present, by which aluminum hydroxide, a gelatinous or nearly transparent mass, is produced. This precipitate has a high affinity for many forms of organic matter, living or dead, suspended or dissolved.

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In this way microbes and particles of clay, so fine that they will pass through even very close filtering materials, are made more bulky. By forcing a liquid thus treated through sand or coke a considerable speed may be secured without sacrificing the completeness of the filtration.

Speaking of alum filtration, Dr. Leffmann said the essential feature of the plants now in operation is simply an automatic arrangement for the regulated introduction of a solution of the aluminum compound, and the subsequent forcing of the water so treated through cylinders of considerable strength filled with filtering materials. The filters are washed by reversing the current. The system of aeration was also treated.

The lecturer spoke of the efficient system of filtration at Girard College, which is in the centre of the district supplied by "direct distribution," where the death-rate from typhoid fever is somewhat higher than in other sections of the city. As a consequence of the alum-filtration, Girard College had but a single death in 1893 from typhoid fever. One or two grains of alum to the gallon is required for filtration, and to that amount there can be no sanitary objection. The Anderson process has been devised to avoid even the possibility of any contamination of the water by chemical materials. In this system the filters are constructed of spongy iron in revolving purifiers. The iron process is not only adapted to clear but to highly-colored waters as well, but is a little difficult to get to work on waters that contain but little dissolved organic matter and but little sustained mineral matter. This process is used at Antwerp, and was at one time operated experimentally at Belmont.

The lecturer noted the high filtering capacity of earth containing iron oxides, stating that he is now using in several places a filter consisting merely of the decomposed ferruginous gneiss found along the west bank of the Schuylkill, opposite Manayunk. Six inches of this material filtered clearly the most turbid Schuylkill water. The filter requires no cleaning, and the operation begins at once.

Discussion.

Selectman Byram spoke of what has been done in Councils in reference to filtration, and said the Water Committee is absolutely and positively in favor of it. The Director of the Department of Public Works admits that filtration is not only practicable, but should be introduced at once. He has asked $250,000 to erect a plant at Lardner's Point, and $320,000 for another at Belmont. The whole matter is now in the Finance Committee, which will no doubt recommend an appropriation, if they can find the funds.

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Dr. Pepper congratulated Mr. Byram and his colleagues on the Water Committee on the evidence of so much definite work in the direction of filtration. "If one helpless person is murdered," he continued, "what excitement and indignation become evident in this peaceful city! Yet the bacteriologists have shown us the criminals in these murders, which are done in our midst every day, the organisms which are preying on the bodies of our citizens. They have shown us how they can be brought to justice and executed. Must the whole matter halt because we cannot get a paltry appropriation of $250,000? If we lost only five out of every 10,000 persons, the city would still be responsible for 600 murders. Munich, by proper sewage and water, reduced its typhoid mortality from twenty-nine to one. We can reduce the death-rate here. No matter what other improvements are sacrificed, this step should certainly be taken. The ordinance should, however, provide that before the system is selected the best expert advice, here or elsewhere, should be consulted, and that after the plant is erected there should be daily tests by skilled bacteriologists. The experience of Plymouth, where a frightful typhoid epidemic was caused by the infection of a mountain stream, should teach us a lesson. The fact that water is clear and comes from a pure source, even from the mountains by aqueduct, is not sufficient. It should be tested daily."

At the suggestion of Dr. Pepper a joint committee of the four organizations present was appointed to direct the attention of Councils to the importance of the subject under discussion.

CORRESPONDENCE.

TESTIMONIAL TO SIR JOSEPH LISTER.

To the Editors of UNIVERSITY MEDICAL MAGAZINE:

DEAR SIRS: Sir Joseph Lister having recently retired from active hospital and teaching work, the occasion has been thought appropriate for presenting him with a testimonial of the esteem in which he is held by his former colleagues and pupils, and committees have, therefore, been formed in Glasgow, Edinburgh, and London for the purpose of raising the necessary funds.

It is proposed that the testimonial shall take the form of a portrait. Subscriptions have been limited to two guineas, and it is hoped that sufficient funds will be collected to permit of some memento of the occasion being presented to each subscriber of that amount.

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As there are probably many surgeons in the United States who may wish to join in the movement, but whose names and exact addresses it has been difficult to ascertain, I should be glad if you would permit me to state that subscriptions may be sent to me at 29 Weymouth Street, Portland Place, London W., England, or to one or other of the following gentlemen, who have kindly consented to act as treasurers, —viz., Dr. James Finlayson, 4 Woodside Place, Glasgow; Professor Chiene, 26 Charlotte Square, Edinburgh; Professor William Rose, 17 Harley Street, London W., England; Dr. Malloch, 124 James Street, South, Hamilton, Ontario; or, J. Stewart, M.B., 37 South Street, Halifax, Nova Scotia.

I have the honor to remain, sir, yours faithfully,

J. FREDERICK W. SILK,

P.S.—Two guineas are about $10.23. *Honorary Secretary.*

FATAL CASE OF POISONING BY QUASSIA.

CHICAGO, ILL., November 19, 1894.

PROFESSOR H. C. WOOD:

MY DEAR PROFESSOR: On Friday, November 16, Mrs. M. came rushing into a drug store, stating that she had poisoned her child by a rectal injection of quassia for seat-worms. She bought five cents' worth of quassia (two ounces) in the morning, poured hot water over it, and kept it on the rear part of the stove all day. In the evening she injected this fluid (about one pint). Five to ten minutes after the injection the child became livid, the lips losing all color; vomited once (contents of stomach), muscles entirely relaxed, and respiration labored. When I saw the child its lips were livid, the skin had a waxy hue, muscles relaxed, breathing labored and shallow, the pulse imperceptible. Death took place about one minute later. I tried artificial respiration, but to no avail. At no time after I saw the child did the heart pulsate; it seemed paralyzed.

I thought the mother might have perforated the intestine with the syringe (a case of that kind having occurred in our neighborhood about a year ago), but such was not the case. Yours truly,

FERDINAND VENN, M.D.

So far as my reading goes there is not on record any case of serious poisoning by quassia. Nevertheless, the experiments of Hoppe show that the active principle is a poison in frogs, especially affecting the nerve-trunks and the muscles. Fifteen milligrammes of it have caused in man violent frontal headache, vertigo, excessive nervous restlessness, with pronounced evidences of toxic gastro-enteritis, such as burning pain, vomiting, and diarrhea. Since receiving the foregoing letter from Dr. Ferdinand Venn, I have had him make inquiries as to the possibility of there having been a mistake in the selection of the drug, but so far as can be made out no mistake was committed, and there is scarcely any drug that could readily be mistaken for quassia wood.

H. C. WOOD.

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BOOK NOTICES.

YOUNG'S ORTHOPEDIC SURGERY: A Manual of Orthopedic Surgery for Students and Practitioners. By JAMES K. YOUNG, M.D., Instructor in Orthopedic Surgery, University of Pennsylvania. Philadelphia: Lea Brothers & Co., 1894.

In few departments of medicine are there so few good works as in orthopedic surgery. It is within comparatively recent times that orthopedics has received the undivided attention of a number of careful and skilful surgeons, which fact accounts for a comparatively limited volume of literature. Workers in this field have been very active, however, in recent years. Orthopedics is now a firmly-established department of medicine, and the literature is growing proportionately. The present work, therefore, will not find an already over-supplied field, but will be found to meet a want among students in acquiring a knowledge of the subject, and among practitioners who constantly see a greater or less number of deformities, and who desire information regarding the most recent views on the pathology and treatment of this subject.

Dr. Young's large experience has particularly fitted him for the preparation of this work, which is based upon his personal observations, although the literature of the subject has been carefully sifted, and whatever of importance he has thus obtained has been made full use of, due credit being given.

The pathology will be found to correspond with the most approved modern views, and the treatment is very thoroughly and comprehensively considered. Especial attention has been given to the mechanical part of the subject. The chapters on Pott's disease of the spine, hip-joint disease, and infantile spinal paralysis are particularly fall and satisfactory. Club-foot is also exhaustively treated. A very valuable feature of the work is the large number of excellently-executed drawings which illustrate the text.

The book is well printed on fine paper, and neatly bound in an attractive volume of 446 pages. In those cases in which doubt is apt to occur, or in which the symptoms may be obscure, the differential diagnosis has been very fully given.

It is somewhat difficult to define accurately the limits of orthopedic surgery, but the author accepts the definition which includes the preventive, mechanical, and operative treatment of chronic and progressive deformities. This ground has been well covered, and the work may be relied upon as presenting the present position of the subject of which it treats.

L'HYSTERECTOMIE VAGINALE. By Dr. L. GUSTAVE RICHELOT.

The work of Dr. Richelot contains no bibliography, no compilation of statistics fabricated from figures taken from almost everywhere. It is simply the exposition of the practice of the author during five years. The conclusions which it draws, the indications which it gives, the

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precepts which it teaches rest upon the careful observations of the 274 patients upon whom Dr. Richelot has operated. The figures are large enough to make the book a good one, and the author has not failed in the attempt.

Primarily, it treats of vaginal hysterectomy directed against cancer. Dr. Richelot, after having recalled the struggle which the operation had to undergo at the outset, the flood of disastrous facts beneath which it just missed being submerged, shows how the results gradually improved as the technique of the operation grew more perfect, and establishes a parallel between subvaginal amputation, which usually cuts full into morbid tissue, supravaginal amputation, which seems no less grave than complete ablation, and, finally, total hysterectomy, for which he makes an eloquent defence. Thirty-eight patients have survived the operation. In ten the cancer has continued without interruption; in eleven relapse occurred on an average six months after the operation; finally, in seventeen the neoplasm has not yet reappeared, although the operation was performed in the last case a little over twenty-eight months ago.

Then follows the study of vaginal hysterectomy applied to inflammatory lesions, suppurative and non-suppurative, to hematic tumors, to obstinate neuralgias, and to uterine prolapse. The author first gives an analytic arrangement of all the facts which he has observed, commenting upon each of them, and giving his failures courageously.

Then follows a very happy chapter upon "the abuse of operations," in which the author brands the "great business men of our profession, for whom the chief indications for operation rest, not upon the study of the lesions and their symptoms, but upon that of the credulity of the patients," and also the petty surgeons of a less elevated rank, "who lie in wait for patients at street-corners, and operate upon them without rhyme or reason."

But the author also shows that some physicians are too frightened by the word operation. Many patients, on account of this, drag on a miserable life when a justified radical intervention would effect a permanent cure.

Vaginal hysterectomy is not an operation so grave nor so difficult to execute as some claim. Concerning complex suppurations and widespread adhesions there is no discussion. Every one agrees that it is the only operation really indicated. Concerning enucleable lesions, the superiority of vaginal ablation is less evident, and "each one instinctively chooses the method which he knows the best;" but the therapeutic result, that at least for which Dr. Richelot pleads with much conviction, is more clearly, more constantly successful after the new than after the old operation.

Dr. Richelot then broaches the delicate question of severe pelvic neuralgias, of those the intensity, duration, and incurability of which furnish the surgeon with a certain indication for operating, whether there is a small lesion of the adjacent parts or not. After having devoted himself to a discussion of the general pathology of hysteria and arthritism, the author demonstrates the superiority of vaginal hysterectomy applied to the cure of patients in whom the pain makes the intervention legitimate.

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For uterine fibroma vaginal hysterectomy replaces advantageously, in most cases, Battey's operation. It is more benign and more efficacious. It should be preferred to abdominal hysterectomy in all uteri which "enclose within their walls one or several tumors, which can only disappear with the organ itself, and, at the same time, those which, not having excessive volume, scarcely reach the umbilicus." It is not that Dr. Richelot condemns ablation in the suprapubic way. On the contrary, he practises it with full confidence, and shows that the prognosis of this operation becomes daily more favorable; but for many cases extirpation by the natural way is preferable.

After a short chapter upon vaginal hysterectomy for uterine prolapse, in which the author shows that, before the insufficiency of the results obtained, one must always, *nolens volens*, return to colporrhaphy, is presented the study of the technique of the operation.

This book, because it is the fruit of a long and great experience, is a good book for young surgeons. For who appreciates the preceptor better than the student himself? Almost all young surgeons, nowadays, obey the fashion and write on surgery, in more or less compendious treatises, articles upon external pathology. That is all very well; upon them, in effect, falls the duty of that unfruitful task. But why do not all our masters give us more frequently a book which embodies their practice of several years upon a particular point of clinical surgery? What precious teaching we lose in that way, and how good an example has Dr. Richelot given us!

The book is concise, comprising 450 pages with the observations. The author has curtailed all incidental discussions, all phrases without point, all useless words.

From the first page, we feel with what sincerity, with what honesty Dr. Richelot has written his book. Is it not true that to make this simple assertion constitutes, in our time, the greatest praise we can apply to a surgeon?

A HAND-BOOK OF MEDICAL MICROSCOPY. By JAMES E. REEVES, M.D. Philadelphia: P. Blakiston, Son & Co., 1894.

This work is evidently written by an enthusiastic microscopist, though a general practitioner for many years. The methods of preparing tissue, cutting sections, and other pathological procedures are clearly described. The author includes mainly those methods which he uses and prefers; but we would take exception to the omission of so important a matter as the method of celloidin imbedding. This is all but generally used for certain purposes, and the student will turn to his hand-book for a description of this method.

The chapters on Bacteriology, Neoplasms, and Urinary Sediments contain the important points which would prove interesting to the general practitioner engaged in microscopy. The glossary may prove of use, but we scarcely see the necessity of incorporating definitions of such words as *quack* and *sanatorium*.

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THE PHYSICIAN'S VISITING LIST FOR 1895. Philadelphia: P. Blakiston, Son & Company.

This well-known work has just appeared for 1895, it being the forty-fourth year of its publication. Its distinctive features remain unchanged, and are so well known that they need not be detailed here. As heretofore, it is issued in a regular edition, accommodating 25, 50, 75, or 100 patients per day or week, an interleaved edition, a perpetual edition, and a monthly edition. One or the other will be preferred, according to custom or the particular requirements of the individual. They are all compact and convenient, and are bound in an attractive manner.

TRANSACTIONS OF THE AMERICAN ORTHOPEDIC ASSOCIATION, Seventh Session, 1894.

The Transactions of the American Orthopedic Association as usual shows marks of the good work which is being done by its members. The papers, which number thirty-three, all repay in their perusal. In addition to the able address of the president, the knee has been the subject of contributions by Drs. Judson, Willard, Griffith, Ridlon, Hoadley, Blanchard, Phelps, Lovett, Taylor, and hip-disease by Drs. Judson, Sherman, Bradford, Thorndike, and Weigel.

THE MEDICAL NEWS VISITING LIST. Weekly (dated, for 30 patients); monthly (undated, for 120 patients per month); perpetual (undated, for 30 patients weekly per year). Philadelphia: Lea Brothers & Co., 1894.

The Medical News Visiting List for 1895 has been thoroughly revised and brought up to date in every respect. The text portion (thirty-two pages) contains useful data for the physician and surgeon, including an Alphabetical Table of Diseases, with the most approved Remedies, and a Table of Doses in both decimal and old systems. It also contains sections on Examination of Urine, Artificial Respiration, Incompatibles, Poisons and Antidotes, Diagnostic Table of Eruptive Fevers, and the Ligation of Arteries. When desired, a thumb-letter index is furnished. In its several styles the Medical News Visiting List adapts itself to any system of keeping professional accounts.

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UNIVERSITY MEDICAL MAGAZINE.

FEBRUARY, 1895.

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE USE OF ANIMAL EXTRACTS.

PART I.

Addison's Disease. CASE I.—Extract of Suprarenal Capsules used.

By J. G. SHOEMAKER, M.D.,
Surgeon to the Phœnixville Hospital.

THE following case of Addison's disease is of especial interest on account of the apparent results caused by the hypodermic use of a glycerin extract of the suprarenal capsules. Careful examination of the family history of the patient, a woman of 30 years, failed to detect any neurotic or other hereditary taint in the stock.

May 30, 1892, Mrs. E. was suddenly taken ill with vomiting, without apparent cause. At that time her weight was 140 pounds, and she considered herself in good health. The vomiting occurred almost daily, but during the summer she gained in weight, so that in September she weighed 186 pounds. During 1893 the vomiting continued, and she steadily lost weight, but was nevertheless able to attend to her family duties, and first reported to me for medical treatment in December, 1893. At that time she was in a condition of profound exhaustion, with malaise, inability to walk 300 yards without rest, and vomiting almost constant. There was some headache, with frequent attacks of dizziness, also of intense rectal pain. Her prostration became so pronounced that she was confined to bed, being unable to raise her head from the pillow. Fainting spells were frequent, at times lasting an hour or two, and vertigo was marked and accompanied by the "taste of blood" in her mouth, as she expressed it. Her pulse

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was weak and thready, but regular and 80 per minute. Excepting the rectal pain before mentioned, which lasted about one week, she has never during her illness suffered any pain. There have been no hysterical manifestations whatever, and no history of any. She has always been irregular in her diet. The vomiting is peculiar. There is never any nausea. There is simply one regurgitant movement and the stomach is evacuated at once. At times there is considerable eructation of gas, but never any acid or bilious vomit. The appetite is not impaired. The odor of vinegar or anything sour will bring on attacks of intestinal colic, which are severe, yet there is a decided dislike for sweets.

The face is of a dark copper color, with very dark rings around the eyes. At times it takes on greenish hues. The lips are pale, the gums are discolored in spots, and about the line of the teeth in the lower jaw there is a dark line resembling the line in lead-poisoning. The lower teeth are fairly well preserved. She wears a plate in the upper jaw. The tongue is slate-colored, more or less coated, never pink. The inside of the cheeks is rather dark. The roof of the mouth is of normal color. The skin on the neck is dark, fading to a lighter color as the breasts are reached. There are dark rings around the nipples. The skin on the back is natural in color; that on the hands and the rest of the body is moderately light. The base of the nails is markedly white, and the finger-tips are pale. The bowels are usually constipated. There is never any diarrhea.

Physical examination of the abdomen and thorax proves negative, except that the heart-sounds are weak. Uterus and appendages normal, except a small stellate laceration of the cervix. The hair is black, dull, dry, and curly, and falling out considerably during the past year; previously it was glossy and abundant. The thyroid gland is normal, and there is no glandular enlargement anywhere. Examination of the urine proved negative.

Dr. James Thorington, of Philadelphia, who first suggested the diagnosis of Addison's disease, states that the optic nerve and fields are normal for both form and color; that the ophthalmoscope shows in each eye: media clear, nerve large, oval, axis horizontal, vessels normal, and no gross changes noted; and that there is myopic astigmatism.

Examination of the blood, made in March, 1894, by Dr. Geo. B. Wood, showed the red blood-corpuscles a little below normal, 4,400,000; the white blood-corpuscles slightly above 205–12; hemoglobin, 54 per cent. Of the protoplasmic corpuscular bodies there were:

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Lymphocytes	10	per cent.
Large mononuclear	10	"
Transitional	2	"
Multinuclear	76	"
Eosinophiles	2	"

In February, 1894, the symptoms became worse and worse; there was also developed a profuse menorrhagia. The patient was confined absolutely to bed, fainting being produced simply by raising her into a semi-sitting position. In spite of careful treatment the condition became more and more serious until April 1, 1894, when she was seen by Dr. H. C. Wood, who suggested hypodermic injections of the glycerite of the suprarenal capsule of the beef. He then had a veterinary surgeon procure us the capsules from the freshly-killed beef, and had a liquid extract in glycerin prepared by the vacuum process (after the Brown-Séquard method), fifteen minims representing ten grains of the capsule. Before the injections were started she was taking nourishment freely, but vomited continuously the liquid diet. The quantity of diet did not influence the vomiting, a tablespoonful of milk being rejected as surely as a glassful.

The first injection was given April 4, at which time her weight had fallen to eighty-nine pounds. The temperature varied from half a degree subnormal to a degree above the norm.

April 8. Temperature, morning, $98\frac{2}{5}°$ F.; evening, $97\frac{4}{5}°$ F.; 12 minims of the glycerin extract injected. Soreness of both arms at points of injection, with threatened abscess on left arm. Headache and sense of fulness and brow pains were noted.

April 9. Injection of 15 minims. Headache continues. Pulse 66. Administered quarter-grain doses of the hydrochlorate of hydrastinine every four hours. Still vomits. Fainting spells on rising in bed.

April 13. Injected 15 minims each morning, alternating between right and left arm on account of the irritation produced by the injections. Morning temperature, $99\frac{2}{5}°$ F.; evening temperature, 99° F. Has slight headache, but says she feels better. Weight 101 pounds. The patient was weighed once a week on suspended scales in her night-robe. All of the succeeding weights represent the weight of the body without other clothing.

April 16. Hemorrhage reduced considerably. Morning temperature, $98\frac{4}{5}°$ F.; evening temperature, $98\frac{3}{5}°$ F. Feels stronger.

April 17. Was propped up in bed. Is much improved. Stomach more retentive.

April 20. Weight 97 pounds. Scarcely any bleeding. Hydrastinine continued. Morning temperature, 99° F.; evening temperature, 98° F. Injected 17 minims.

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April 24. Sitting up in chair. Is very much improved.

April 27. Weight 98 pounds. Injected 20 minims. Able to walk about the room.

May 4. Walked down-stairs. Weight 100 pounds. The merest trace of bleeding. Stomach retentive.

May 11. Back in bed with an attack of tonsillitis, which lasted a week, temperature reaching 102° F. Weight 98½ pounds. Now injecting 20 minims every second day.

May 18. Stopped injections for one week. Vomiting returned. The temperature remains about 99° F. Weight 100 pounds.

May 25. Weight 102 pounds. Injecting 20 minims every third day. Temperature remains about 99° F. Vomiting is less frequent. Hemorrhage ceased entirely.

June 4. Weight 107 pounds. Injections stopped.

The injections were continued exactly two months. Their influence on the temperature was not marked either way. A careful record of her temperature, which was kept from April 4 to November 18, shows that, while at times it would be subnormal for a week, it never reached lower than 97° F., it was more frequently above normal, registering between 99° and 100° F. The only marked elevation of temperature she had was during the attack of tonsillitis. The influence of the injections on the weight is, however, more marked. It will be noticed that in the beginning of her trouble she weighed 186 pounds. The menorrhagia helped to reduce her to eighty-nine pounds. After the bleeding had ceased, and the injections increased to twenty minims per day, and the stomach became more retentive, she averaged one pound a week increase in weight. When the injections were stopped, the weight dropped seven pounds during the following four weeks, and remained stationary at 100 pounds for the succeeding month. Since that time—July—she has been steadily and progressively improving until she now (November 16, 1894) weighs 108 pounds. Her condition to-day is apparently that of a well woman, excepting that she still vomits her meals regularly. She has a good appetite. The bowels are regular. She is troubled occasionally with eructations of gas. She is in good spirits, the old spells of depression being entirely absent; the fainting attacks, frequent before, have now disappeared. She is able to do housework, to walk at her pleasure, and only extra exertion fatigues her. The duration of this case now extends over thirty months. While the objective symptoms remain about the same, the marked improvement in the subjective symptoms leads me to think the treatment has been of avail.

Remarks by Professor H. C. Wood.—So far as my reading and knowledge go there are no pathognomonic symptoms in Addison's disease, if,

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indeed, the so-called Addison's disease be not really a group of diseases; but when I first saw the present case, the profound asthenia, the extraordinarily persistent and always seemingly causeless vomiting, and the distinct, though moderate, bronzing, in association with the apparently hopelessly progressive course of the disease, made a picture as typically resembling that of Addison's disease as can well be imagined. I do not, therefore, see how the diagnosis of Addison's disease can be gotten away from, unless the position be assumed that a certain case is not Addison's disease simply because it does not die; and even if Professor Osler does say "the disease is in every case fatal," it hardly seems to me logical to deny a diagnosis on such grounds. Further, it is entirely clear that Mrs. E. is not yet well, although she is going about freely, and recently came without apparent fatigue from her country home to my office. At this visit the blood examination showed 75 per cent. hemoglobin, red corpuscles 4,800,000.

Moreover, the causeless vomiting still continues, a portion of almost every meal being thrown up; and her weight has not yet nearly reached its former point. It should be remembered that in such a case, as in myxedema, it is not logical to suppose that the animal extract will cure. The theory of the application of the animal extracts is that so-called "ductless glands," such as the thyroid body, the suprarenal capsules, and probably, also, the spleen, supply something that is necessary for the general nutrition, and that when a "ductless gland" is diseased, it is possible to imperfectly supply this needed material by material obtained from animals. Supplying the general nutritive need does not cure the diseased organ, though it gives temporary relief to the system; and it is therefore evident that the artificial supply must be kept up indefinitely. I do not want to claim too much, but the results so far achieved in the present case are exceedingly interesting, and certainly make further trial of the remedy in other cases imperative.

Part II.

Graves's Disease. Case I.—Spontaneous Cure Occurring During Abscess of the Spleen. Case II.—Very Great Relief Apparently from the Use of Extract of Spleen.

By H. C. Wood, M.D.

Case I.—Miss H. J. first consulted me in the fall of 1893, giving the following history: In the spring of 1891, after a severe mental and physical strain caused by the long illness and death of a sister from exophthalmic goitre, she began to feel nervous and out of sorts, and to notice a lump growing in the lower part of her throat. Nevertheless, there was no marked failure of health until March, 1891, when, after seeing her father thrown from a carriage, she had an attack of chorea,

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followed by increase in the size of the lump in the throat. She then went to Europe, and partially recovered her health, remaining, however, very nervous. March, 1893, after nursing an aunt through a long illness, there was great increase of the nervousness, which was now accompanied with persistent, severe palpitation of the heart. She went to Clifton Sanitarium, but grew worse under a course of baths, etc., losing twenty pounds; and after coming home, in April, was one month in bed with great weakness, nervousness, frequent and severe palpitations of the heart, and distinct increase in the size of the lump. During the summer she very slowly improved under constant medical care, including climatic change, etc. November 29, 1893, she was sent to me by her physician, Dr. G. D. Nutt, of Williamsport.

The diagnosis was perfectly clear in that she had the peculiar nervous restlessness and irritability of old exophthalmic goitre, pronounced rapidity of the pulse, without cardiac murmur or any evidence of disease of the heart walls, and very pronounced enlargement of the thyroid gland. Careful examination of the eyes showed astigmatism, but no exophthalmia or other ocular lesions. She was treated with rest in bed, use of tonics, cardiants, and other remedies commonly employed in her disease. For a number of weeks careful trial was made of the application, twenty minutes twice a day, of Leiter's tubes, with very cold water, over the cardiac region. As the result of very numerous trials it was found that almost invariably a slight reduction of the pulse-rate followed the use of the tubes; the average amount of reduction being three beats per minute. The average pulse taken daily before getting up in the morning was 95. She remained under care until Christmas, 1893, gaining somewhat in weight, and improving in her nervous condition, but without marked alteration either in the pulse or in the thyroid gland.

In January, 1894, Leiter's tubes were applied daily for twenty minutes to the thyroid gland, without any perceptible effect, unless it were a very slight increase in the pulse-rate immediately following the application. This increase was not sufficiently constant or great enough to be of any import. Under treatment she continued to very slowly improve. March 24, she was ordered five grains of the extract of thyroid gland to be taken by the mouth, three times a day, and two days later was sent to Virginia Beach. The extract of the gland was taken regularly until the early part of April, when she developed a violent exacerbation of her disease, attended with intense nervousness, much mental excitement, great sleeplessness, complete anorexia, and severe tachycardia. Although she herself believed that this exacerbation was due to the free use of atropia in her eyes under the orders of the oculist, the attack really began before her visit to the oculist; and

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unless it was produced by the thyroid extract was without apparent cause.

The night of April 26, Miss J. had slight pain in the left side of the abdomen, but was able to come the next morning to my office; on returning, however, she was forced to go to bed by great increase of the pain. In the late evening there was a violent chill, followed by a rapid rise of temperature to 103° F. This was the commencement of a long illness, which was at first supposed to be a typhoid fever. The symptoms were continuous pain, with paroxysms of violent exacerbation in the splenic region, nausea, headache, mental distress, and anxiety; with a pulse which varied from 130 to 132, was always feeble and at times intermittent. There was at first some diarrhea (not dysenteric), which was followed by a tendency to constipation. The temperature had an almost regular range of from 99½° in the morning to 103° F. in the evening; some days, however, falling as low as 99° in the morning and ranging as high as 104° F. in the evening. Splenic enlargement became manifest on the second or third day, and rapidly increased; the tumor being always intensely tender. The pain, which was very severe in the first few days of the illness, greatly abated at the end of the first week, but it never entirely disappeared, and returned with great severity in the fifth week.

The treatment was supporting and symptomatic. In the early part of the second week it was noted that the *thyroid gland* was becoming smaller, and by the fifth week it *had entirely disappeared.* In spite of all that could be done the patient developed under the long continuing fever the ordinary symptoms of a typhoid state to a very marked degree, presenting the aspect, indeed, of an advanced typhoid fever. The diagnosis of splenic abscess having been made, Professor J. William White was called in and agreed in the diagnosis. After careful discussion, however, it was decided to wait longer before operating, in order to allow close attachment to be formed between the spleen, and the abdominal walls. In the first week of June the temperature ranged between 101° and 101⅘° in the morning and 103° and 104° F. in the evening. The general exhaustion was becoming alarming and the local splenic pain and tenderness more and more severe. June 6, Dr. White ran the needle of an aspirator into the centre of the spleen, and, obtaining seven or eight ounces of foul pus, cut into the seat of the abscess and inserted a drainage-tube. The shock from the operation was not very severe, but during the next eleven days the temperature ranged between 103° and 104° F. During this time the wound was regularly syringed out with antiseptics, and once or twice was re-opened and thoroughly explored without the finding of more pus. On the eleventh day after the operation the wound was still dis-

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charging, but the temperature dropped to 99½° F. in the morning, with an evening temperature of 102½° F. There was, however, at this time profound exhaustion, with a very feeble pulse, 110 to 120; typhoid delirium at night and extreme mental feebleness in the day, with marked incoherency.

As the weather in Philadelphia was becoming very hot, on June 17 Miss J. was, by my advice, taken to Williamsport. She was moved in a basket stretcher, bore the journey fairly well; but was during it and afterwards incoherent not only in her speech but evidently in her mental action; being at times, indeed, delirious. This mental condition began to improve in about two weeks, but it was not until the latter part of July that she was able to find the right word to express her thoughts. The temperature a few days after her removal home fell, ranging for several weeks from 98° in the morning to 100° F. in the evening; the pulse ranged from 104 to 120. There was at first much nausea, occasional vomiting, and great loss of digestive power. She gradually improved, except for a few days, during the latter part of July, when she had an attack of severe acute indigestion and diarrhea, which reduced her greatly. August 16, convalescence seemed fairly established; the 1st of September she weighed ninety-one pounds, the 17th of September she weighed ninety-five pounds. By the latter date the wounds had healed completely; she was able to walk a little by herself, and digestion was good. The tongue was clean, the temperature normal, the bowels natural. The pulse was still quick, 115 to 120 beats per minute.

For an account of the case as embodied in the last paragraph, I am indebted to the nurse, who left the patient as convalescent in the last of September. In November I had the pleasure of a visit from her family physician, Dr. Nutt, who stated that Miss J., though not thoroughly strong, was very much better than she had been for years; that the pulse was about normal in rate; and that there had been no re-enlargement of the thyroid gland.

Remarks.—The clinical history of myxedema, as produced by removal of the thyroid body, indicates very strongly that there is some mysterious relation between that body and the spleen; removal of the thyroid being followed as a regular sequence by splenic enlargement. The extraordinary case just recorded certainly lends further credence to the theory of such relation, since there appears to have been a spontaneous cure of Graves's disease as the result of an acute splenitis ending in abscess. The cause of the splenitis remains obscure; it was finally attributed by the patient and I believe by Professor White to a wrench or injury received while dancing at the sea-shore; but, during the first four weeks of the disease, careful inquiry by myself failed entirely to

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elicit from the patient any such incident, and at the end I was very doubtful as to the correctness of the theory.

From this and other cases which I have seen I am very strongly of the opinion that the exhibition of thyroid extract in Graves's disease usually is not negative in its result, but produces distinct exaggeration of the symptoms; a fact which is in accord with that theory of Graves's disease which considers it to be a structural and functional hypertrophy of the thyroid body, a theory which finds further corroboration in the results which have been achieved in various cases by partial removal of the enlarged thyroid. If there be naturally a balance of function between the spleen and the thyroid body, and disturbance of one produces disturbance of the other; and if extract of thyroid in myxedema with enlargement of the spleen does good whilst it does harm in Graves's disease, it is but a natural suggestion that the extract of spleen should be tried in cases of Basedow's disease. I have, therefore, had prepared a glycerin extract of beef spleen, but so far have had opportunity of using it only in one case, as follows:

CASE II.—Miss B., aged 24, dated beginning of her present illness to January, 1893, though it probably really began long before that time. February, 1894, entered the Orthopedic Hospital; treated for ten weeks with rest cure with marked improvement, followed, however, by rapid return of the symptoms. Had menstruated but once in a year. On entering the University Hospital, October 14, 1894, there was marked exophthalmus, Von Graefe's symptom, however, being absent. Pulse, when quiet in bed, 92 to 98; temperature daily varying from one and a half to two degrees, usually subnormal in the morning. Patient extremely nervous. Thyroid much enlarged. Weight ninety-seven. She was put to bed for the greater part of the day, given massage, careful feeding, and 1-200 of atropine, three times a day, hypodermically. This treatment was kept up for eighteen days, with distinct improvement: weight then 101½ pounds, nervousness distinctly less, daily swing of the temperature reduced to about one degree. She was then put upon hypodermic injections of five minims of the splenic extract daily; in a day or two this was increased to ten minims. No local irritation was produced by the injection. During the month of November she steadily improved, a marked reduction taking place in the size of the thyroid gland, her nervous symptoms disappearing, the pulse decreasing rapidly until it ranged between 82 and 90, and the bodily weight increasing seven pounds. In the fifth week after the institution of the treatment, menstruation, which had occurred only once in the previous twelve months, came on with great nervous disturbance, violent headache, abdominal pain, marked hysteria, etc. After menstruation the gain of the patient went on even more rapidly, and she was dis-

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charged from the hospital early in the eighth week of treatment; the thyroid gland was greatly diminished but had not quite disappeared; the bodily weight had risen to 113½ pounds, a gain of nearly two pounds a week after the institution of the treatment with the extract; the pulse had become normal in rate, ranging from 74 to 82; the temperature had a regular daily swing of two-fifths of a degree only. She considered herself well, and one week later reported by letter that she was in excellent condition, in spite of the fact that she was actively visiting.

SOME REMARKS ON THE ETIOLOGY AND TREATMENT OF PUERPERAL FEVER, WITH A REPORT OF TWO CASES.

By George A. Muehleck, M.D.,

Philadelphia.

In the light of our present knowledge of bacteriology and antiseptic technique it would be reasonable to suppose that the occurrence of puerperal fever, at least in the practice of physicians, should be a very rare event. Yet such does not seem to be the case, except, perhaps, in some well-conducted institutions. The melancholy fact remains that the mortality from this disease is about the same as before the introduction of antisepsis into obstetrical practice. Hegar, in his admirable monograph,[1] shows that in the Grand Duchy of Baden the number of deaths during the three weeks following labor has varied very little during the period from 1873 to 1887 inclusive. In 1873 there were recorded 34,553 births, with a post-partum mortality of 235, or 0.68 per cent.; of these 110, or 46.8 per cent., were due to puerperal fever. In 1880 the number of births for the entire Grand Duchy was 56,530, with a mortality of 415, or 0.73 per cent.; of these 232, or 56 per cent., are credited to puerperal fever. In 1887 54,322 births were recorded, with a mortality of 368, or 0.68, the portion due to puerperal fever being placed at 49 per cent. From these figures it can be seen that the mortality of the year 1887 (0.68 per cent.), when antiseptic technique had been generally introduced and legally enforced in Germany, is no improvement on that of 1873 (0.68 per cent.), before such general introduction. The number of deaths post-partum credited to puerperal fever in most statistics is, however, generally below the truth, since

[1] Zur puerperalen Infection und zu den Zielen unserer modernen Geburtshilfe. Volkmann's Klinische Vorträge, No. 235, 1889.

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many physicians, in making their returns of such deaths, are often too prone to accredit the cause to peritonitis, pneumonia (embolism), lymphangitis, typhoid fever, etc., to shield either themselves or the midwife, well knowing that the public has a tendency to hold the accoucheur responsible for any deaths during confinement or the lying-in period. While the above figures, taken at random from a long series, seem to show that the introduction of antisepsis in midwifery has not been attended by any benefit, yet I think that the true explanation does not lie in this direction, that it is not antisepsis *per se*, but that the fault lies in the meddlesomeness which it undoubtedly has encouraged. Hegar shows that in the period 1870–1872 171,832 births were recorded in Baden, with a total of 6909 operations (inclusive of simple manual extraction), or 1 operation to 24.8 births; in the period of 1883–1887 271,283 births were recorded, with 17,533 operations, or 1 operation to every 15.4 births. The mortality of those operated upon in the period 1870–1873 was 5.2 per cent., in 1883–1887 3.2 per cent., showing that while antisepsis has not lowered the general mortality it has perceptibly decreased the mortality of obstetric operations. What has been gained in this direction, however, has been lost in the unwarranted meddlesomeness, as shown by the increased number of unnecessary operations which it has encouraged. Unfortunately, in the literature within my reach, I could not find any reliable records on puerperal fever occurring in private practice in this country; there is no reason, however, to believe that they differ materially from those quoted above. Tanner[1] reports 9 cases of a total of 623 delivered, with 3 deaths, a mortality of 0.5 per cent. The statistics of other writers pertain to hospital practice, and hence cannot properly be compared with our figures. The most brilliant are the results of Dr. J. Price, of this city, who recently reported 1000 deliveries in the Preston Retreat, with a mortality of *nil*. In the figures given above, while they show the approximate mortality, no reference is made to the morbidity of puerperal infection. The number of cases which recover, either wholly or partially, cannot be ascertained, the statistics being even more unreliable than those pertaining to mortality.[2] The number of incomplete recoveries, or those with local manifestations of disease following infection, such as peri- or parametric abscesses, salpingitis, oöphoritis, or the consequences of embolic processes, with more or less chronic invalidism, is certainly very great. That puerperal fever belongs to the class of preventable diseases can no longer be denied, since Semmelweiss first called attention to the resorption of septic material as its causative fac-

[1] Annals of Gynecology and Pediatry, July, 1893.

[2] Comp. Hegar, Zur geburtshilflichen Statistik in Preussen und zur Hebammeenfrage. Volkmann's Klinische Vorträge, No. 29.

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tor. Since then bacteriological research has not only confirmed Semmelweiss's teaching in this respect, but has shown that puerperal fever is not a disease *sui generis*, but that it may be caused by a variety of micro-organisms, and that the latter bear the same relation to it as they do to suppuration and general wound infection, and hence that a large majority of fatal cases are due to streptococcus invasion. To Meyerhofer belongs the credit of first publishing such observations, in 1885. Shortly afterwards there appeared the papers of Rindfleisch, Feltz, Recklinghausen, Waldeyer, Klebs, Orth, and others. Pasteur was the first to cultivate the streptococcus from a woman dead of puerperal fever, his results being soon confirmed by Fränkel, Jowanaovix, Somer, Winckel, Bumm, Döderlein, Winter, Ott, Williams, and others. That other micro-organisms may occasionally cause puerperal infection has been shown by Czerniewski, Fehling, Hagler, Döderlein, Kröling, and others, but such cases are rather rare, and are generally characterized by a mild course. In this connection may be mentioned the bacillus coli magnus, the gonococcus, the tetanus bacillus (Witte), and others. Mixed infection by staphylococci and streptococci was observed by Döderlein.

Our present knowledge of the etiology of puerperal fever is of the greatest practical importance to the obstetrician in the management of labor and the lying-in period: subjective antisepsis and absolute objective cleanliness have thereby been rendered imperative. In explanation of the question how the infectious material gains entrance into the organism two theories have been advanced. Semmelweiss believed that under favorable conditions decomposed animal matter was resorbed in the organism, thereby causing infection; this he termed auto infection, claiming, however, that the majority of cases are due to infection from without. Auto-infection in a strictly etymological sense cannot exist, since we know now, what Semmelweiss did not know nearly forty years ago, that decomposition without micro-organisms is impossible, and that the latter must come ultimately from without, no matter how long previous to labor they had existed in the genital tract, and this is in effect the modern theory of auto-infectionists. Bacteriological research has demonstrated the frequent presence in the genital tract of pathogenic micro-organisms, and in this connection may be mentioned the frequency of erosions and purulent catarrhal affections, gonorrhea, etc. *A priori* it could therefore be assumed that auto-infection is a common occurrence, while in truth it is very rare; the increased secretions, the rupture of the sac of water, the passage of the tight-fitting head, and, finally, the flow of the lochia may partly account for this. If the danger of auto-infection is admitted, the only rational proceeding would be ante- and post-partum douching, etc., but who can

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deny that more harm than good is done in this way? Since 1889, Leopold, of Dresden, has ceased using prophylactic douching, and finds that puerperal infection occurs only five-ninths as often as formerly. Meriman has reported 900 cases in which only subjective asepsis was used, and, although his cases are examined very often, his morbidity has decreased from 21 to 6; this includes all slight elevations of temperature, even those due to extra-genital causes. This decreased morbidity he very justly attributes to increased experience in subjective asepsis on his part and that of his assistants. Other experiments have been recently made to determine the relation existing between auto-infection and morbidity. Confinements were divided into two classes. In the one subjective asepsis alone was observed, in the other rigid disinfection of the vagina and os uteri was practised; the results of the former are more favorable than the latter. The habit of frequent internal examinations greatly increases the chances of infection, especially when the surroundings are unfavorable. They should therefore be restricted to the least possible number, and external examinations resorted to. After the exact position of the head has been ascertained by combined internal and external examination, it is, as a rule, easy to watch its descent by external palpation alone. I firmly believe that by experience gained by practice, internal examinations could be reduced to a minimum.

The use of the forceps is also too common, the busy practitioner being anxious to end a tedious labor by resorting to it; and yet there can be no doubt that by doing so he subjects his patient to unnecessary danger. If the condition of the mother is normal, the pains good, the fetal heart-sounds good, and the head presenting properly there is no reason to interfere. Sufficient time should be allowed for the expulsion of the after-birth; slight rubbing of the fundus to encourage contraction is generally all that is required. During the first week after labor the temperature and pulse should be watched. Slight elevations of temperature are common; if, however, the general condition is good and the lochia normal, no apprehension need be felt. When infection is suspected, the treatment should consist in the thorough disinfection of the entire genital tract, the vagina and uterine cavity should be thoroughly douched with a bichloride of mercury solution, 1 to 2000, the cavity of the uterus thoroughly curetted, a stylus of iodoform introduced, and a rope of iodoform gauze reaching from the fundus to in front of the vulva inserted, baths, or if these be impracticable, the cold pack with cold effusions to combat the fever. Internally no drug, in my estimation, can be compared with alcohol,—it should be freely given. Quinine, even in twenty-grain doses, has proved an utter failure in my hands. If under this treatment improvement rapidly takes place,

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nothing more will be needed; if not, other means should immediately be resorted to; and in this connection I would urge the use of constant irrigation of the uterine cavity. In looking over the literature of this subject within my reach, to my surprise very little could be found in reference to this most valuable procedure. Schroeder[1] seems to be the only one who used it extensively; he says, "By this method very favorable results can be obtained, the whole genital tract can be thoroughly irrigated, and, besides, by using very cold solutions, a very powerful general antiseptic effect can be obtained," and further on he says, "The mortality of puerperal fever can be reduced by such local treatment with the same certainty as the number of cases can be reduced by a careful prophylaxis." Contra-indications to permanent irrigation are few; several writers have observed rigors and symptoms of collapse, which were, however, probably due to carbolic acid poisoning.

When general peritonitis has developed it is, of course, to be decided whether the necessary manipulations (insertion of tube, etc.) are admissible or not. It is unnecessary to observe that when general sepsis with metastasis in other organs has developed no treatment can avail.

Before closing this paper, the following two cases may be of interest. In Case II permanent irrigation was used with complete recovery; Case I, in which the ordinary, general, and local treatment was used, ended fatally.

Mrs. G., a strong, healthy German woman, was attended by me in confinement on March 21, 1893. Examination revealed a somewhat contracted pelvis of masculine type. Fetal head presented in right occipital position, pains good. After about twenty hours' labor and after pains had almost ceased, I applied the forceps and delivered her of a healthy male child. Thorough irrigation with a bichloride of mercury solution of 1 to 2000. On the 23d a severe rigor, pulse 130, temperature 104½° F. No pain; no tympany. Treatment: curettement of uterus, thorough intra-uterine irrigation, inserted stylus of iodoform and also a rope of iodoform gauze for drainage. Alcohol and quinine in large doses. March 24, temperature 104½° F., pulse 140. Uterus and vagina covered with diphtheritic membranes. Same treatment continued; in addition, a full-strength solution of hydrogen peroxide was thrown into the uterus. Cold pack with cold effusions. During next three days no material changes; temperature varying from 102° to 105° F., pulse very rapid, general condition bad. March 29, symptoms of general peritonitis, and death on March 31.

[1] Lehrbuch der Geburtshilfe, 6th edition, p. 776.

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CASE II.—Mrs. K., German, healthy, was delivered on March 25 of a healthy child; left occipital position, labor easy, placenta adherent, manual extraction. March 27, a severe rigor, pulse 124, temperature 104° F., no pain, no tympany; same treatment as in Case I. March 28, temperature 105° F., pulse 136; uterus and vagina covered with diphtheritic membranes; resorted to permanent irrigation; a Bozeman catheter was inserted far up into the uterine cavity and attached to a large fountain-syringe, which was kept constantly filled with a cold creolin solution. The return flow was caught on a rubber blanket with a funnel arrangement through the mattress. March 29, temperature 101° F., pulse 120; had rested well; general condition better; large quantities of membranes washed out of the vulva; irrigation continued. March 30, temperature 100° F., pulse 110; irrigation discontinued. On my return in the evening temperature was again 104½° F., pulse 135; irrigations recommenced, and continued during the following four days and nights, the temperature varying between 99° and 101° F., the patient experiencing no discomfort and resting well. April 4, irrigation again discontinued; eight hours later temperature again 103½°; irrigation again commenced, and continued until April 10, when it was again stopped, with the same result as to pulse and temperature; it was therefore continued until April 12, after having been in almost constant use for fifteen days and nights. The quantities of membranes washed away during the first week were enormous, but gradually diminished, and eventually disappeared entirely. After removal of the tube the temperature remained slightly elevated during several days and then fell to normal. Examination of genital tract revealed a clean and normal mucous membrane.

Although I am perfectly aware that one case would be insufficient to determine the value of any treatment, yet the very favorable result obtained in Case II, compared with Case I, seems to me to confirm the observations of Schroeder and to encourage to further trial. The powerful antipyretic effect which these irrigations exerted was shown very forcibly in this case after each interruption, the temperature each time rose very suddenly, and the pulse-rate increased, only to be again controlled when irrigation was resumed. The advantages which I think can be claimed for this method are (1) thorough disinfection of the genital tract; (2) a more powerful antipyretic action than by any other agent; (3) the temperature in the uterine cavity is very energetically reduced, and the growth of pathogenic organisms is to a certain degree inhibited; (4) instant removal of infectious material by the return flow; (5) ease of application, the tube remaining undisturbed in position as long as desired. In my opinion the usual curetting and douching as practised generally are inadequate, the former being un-

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doubtedly useful in removing retained portions of secundines, but totally insufficient to remove all foci of infection from the large relaxed uterus. The douche, while also useful, does not permit the disinfecting fluid to remain in contact with the infected parts sufficiently long to exert a very powerful germicidal action.

"STAMMERING OF THE URINARY ORGANS" (PAGET).

By J. Henry C. Simes, M.D.,

Philadelphia.

Pathological conditions of the genito-urinary tract, which occasion any interference or difficulty in performing the act of micturition, are frequently met with during the daily course of the physician's duties, and their importance on this account, aside from their own significance, is fully recognized by all surgeons and physicians. On the other hand, those cases in which there is no evident pathological change to account for difficult or impossible micturition are equally important, and while they are not so often encountered, they occasionally are seen, and therefore their consideration is not without interest. Although the cases in which no pathological condition is demonstrable are not of so serious a nature as those in which the lesion is evident, yet when the frequency and importance of emptying the bladder is remembered, any hinderance to the normal passing of urine becomes a grave matter for the consideration of the physician, and may be a serious if not a fatal one for the patient; since the physician is only too fully aware of his imperative duty to relieve such a condition, and the patient is only too conscious of the condition in which inability to urinate places him.

It has been my experience with the class of patients who are sufferers of difficult micturition not depending upon any evident pathological cause, but the so-called functional causes, that, while their actual suffering is not so great as those in which there is a positive pathological cause, yet, the mental impression which their condition occasions is truly deplorable. They seem to live in a constant state of dread of what is to happen; they have lost all ambition in the affairs of life; they pass their time in consulting different physicians as to the nature of their trouble, and it is impossible to convince them that their condition is more one of inconvenience than one of a serious nature; indeed, like any of those conditions, whether due to pathological causes or to functional disturbances, affecting the organs of generation, there

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arises a peculiar mental state that occasions great depression, and may possibly terminate in melancholia.

Among those cases in which no pathological lesion can be ascertained to be present to account for the difficulty in micturition, those which Paget has so aptly named "stammering of the urinary organs" are of peculiar interest, and his description of a case of this kind is as follows: "The patient can often pass his urine without any trouble, especially at customary times and places; and, when he does so, then the stream is full and strong, and he has nothing the matter with him. But at other times he suffers all the distress that he might have with a very bad urethral stricture. He cannot pass a drop of urine, or, after passing a few drops there comes a painful check, and the more he strains the less he passes; and then complete retention may ensue, and overfilling of the bladder." While cases of this class are occasionally met with, they are of not very frequent occurrence, and therefore the two following may not be without interest.

H. L., aged 52 years, engaged in the manufacturing business. He gives the following history: Had always enjoyed fair health, although of not a very robust nature. Ten years ago, after having undergone a very severe mental strain, he first had some difficulty in passing his urine. At this time he was examined for stricture, with negative result. Following the examination, he states, there was an attack of cystitis, and for the next three or four years he suffered with bladder troubles, and difficulty in passing his urine; indeed, until the present time he has been more or less troubled with interference in urinating.

Mr. L. first came under my observation three years ago, when he gave me the above history, and upon further questioning I ascertained that he was then suffering with some difficulty in passing his urine, the nature of which was that he was not able always to micturate; there was no pain along the genito-urinary tract, only the uncomfortable sensation of wishing to pass urine and not having the power always to do it; there had never been complete retention of urine for any long period of time,—that is, for twenty-four hours,—but he had frequently passed ten or twelve hours without being able to empty his bladder, when the power would return, and he was able to urinate without any difficulty, passing his water in a full stream and using no more than the ordinary muscular exertion. He cannot give any reason why he is at one time able to urinate in a perfectly normal manner and at another time is powerless to pass a drop of urine: neither time nor place seems to have any influence over the attacks, nor does the condition of his health appear to control them; in fact, to him, as far as he has observed, he has never been able to connect this inability to empty his bladder with any cause whatsoever; he cannot foretell when an

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attack is going to occur, nor when it will pass away. The difficulty of urinating may continue daily for several weeks, and even two or three months, and again there may be an interval of months when he is capable of urinating in a perfectly normal manner. Whether the bladder contains a large or small amount of urine, it apparently has no influence in causing an attack, since under either condition the difficulty is liable to occur; nor does diet seem to affect his condition; in fact, from very careful questioning I was unable to assign his affection to any apparent cause,—that is, as to what occasioned the attacks.

Examination of the urethra by means of sounds gives no information as to the cause of his trouble; the canal is not over-sensitive to the passage of the instrument; at the prostatic region of the urethra the normal hyperesthesia is evident when the sound passes over the part; the bladder is not more than ordinarily sensitive to the presence of the instrument; the calibre of the urethra is fully up to the normal size, permitting a full-sized sound to pass into the bladder without any hinderance; there is no spasmodic contraction of the muscles of the urethra occasioned by the introduction of the sound; indeed, the urethra gives no indication of any pathological condition, and the same may be said of the bladder. The prostate was examined, and appeared to be in a normal state, no enlargement or tenderness is evident to the finger when passed into the rectum. An examination of the urine gives no indication of any pathological change in any of the organs connected with the urinary system: its color, quantity, and specific gravity are normal; there is no reaction to the sugar tests; albumin is not present; the urates are not in excess; the phosphates are slightly above the normal quantity, and there are a few more than the normal number of leucocytes present; also the deposit of mucus is rather more than is observed in normal urine; no casts of any description are seen.

The above history and examination can but lead to one conclusion, and that is the condition of the patient is one which does not depend upon any evident pathological lesion of the genito-urinary organs, but is the result of some peculiar condition of the nervous system that affects the muscular system which has for its function the emptying of the urinary bladder. As Paget writes, the organ stammers, and "stammering," he says, "in whatever organs, appears due to a want of concord between certain muscles that must contract for the expulsion of something, and others that must at the same time relax to permit the thing to be expelled." That the symptoms complained of by Mr. L. are due solely to this want of concord in the action of his muscular system connected with the act of micturition is the only conclusion to be reached, and, therefore, the diagnosis of stammering of the urinary organs may very properly be applied to his case.

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The second case is a younger brother of the above: he gives the following history: Several years ago he first noticed some difficulty in urinating,—that is, he was at times unable to pass his urine,—and this difficulty occurred without any known cause; the attacks occurred at irregular intervals, between which he passed his urine in a normal manner. I may say that he gives a history very similar to that which I have above related in the case of his brother; but, unfortunately for him, shortly after he was first attacked with the symptom of interference in micturating, he had a fall while riding his bicycle, which occasioned him some pain in the perineum and penis; a surgeon was consulted, and the diagnosis of a stricture of large calibre of the urethra was made; treatment was begun for this lesion, and an attack of acute cystitis followed, terminating in chronic cystitis, from which he has never recovered. My connection with this case began three years ago, at the same time I had his brother under my care, and upon examination I found the case to be one of acute cystitis, occurring in a bladder which had for several years suffered with chronic inflammation, and that these attacks of acute inflammation had at irregular intervals affected the organ since he was first treated for a stricture of large calibre. This complication of cystitis has in a measure masked the original trouble,—the stammering of the organ,—and has also added very much to his suffering. That the stammering still exists I am satisfied from my observation of the case during the past three years, and, although the cystitis has never been entirely recovered from, notwithstanding the most persistent treatment, yet at times he has been almost free from any of its symptoms for a considerable period, but during these intervals of abatement in the cystitic trouble there have been, now and then, attacks of difficulty in passing water, which in every way resemble those described in his brother's case.

Examination of the urethra and bladder gave no indication of any pathological condition which would account for the interference in urinating: there was no obstruction to the passing of a large-sized sound, except an over-sensitiveness at the neck of the bladder, due, undoubtedly, to the long-continued inflammation of this organ; the prostate seemed normal. Examination of the urine gave no indication of any morbid change in the kidneys; there were present the usual constituents of chronic cystitic urine-pus-cells, epithelium, phosphates, albumen, and mucus.

I may here state that in both the above cases there is no history of there ever having been any venereal disease, nor is there any evidence, after careful examination, that the patients have ever suffered from such affections. They are both unmarried, and sexual excess has never been indulged in; indeed, I have every reason to think that they

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have both lived very continent lives, not only in regard to the sexual passion, but temperate in all things. There is no history or indication of any injury or disease of the genito-urinary system ever having existed during the life of either patient, except their present complaint.

In conclusion, a word upon the treatment of these cases of stammering of the urinary organs; and I wish I was able to offer something more encouraging than my experience with the two above cases. Everything which in any way presented the faintest hope of relief has been given a trial, and I can here say that both patients were fully competent and only too willing to carry out all instructions, but nothing has ever been of any permanent benefit. Now and then a change in the therapeutics or method of treatment has raised their hopes, but it has always proved a temporary condition: sooner or later there was a return of the old trouble, and a corresponding depression in the mental state of the patient. It would be useless, as well as unprofitable, to enumerate all the different therapeutic remedies which have been administered and all the methods which have been employed in the treatment of these cases: it is sufficient to say that nothing has been of permanent benefit, and the advice given by Paget, some twenty-five years ago, holds good to-day; my experience in the treatment of these cases is in full accord with him. He writes as follows: "The treatment of stammering urinary organs has difficulties similar and equal to those of treating stammering speech. The patient must try to educate himself to a calm control of his muscular power; and on any occasion of failure must get what help he can from such mental tricks as I have referred to. He should evade all risks of difficulty, and all the conditions in which he has suffered his worst failures. He should do anything rather than fail to pass his urine. He should not always yield to the first impulse to pass it, but should try to regulate the actions of the bladder to certain fixed hours of the day. And especially he should learn to use a catheter, not only that he may thus relieve himself in case of absolute need, but that he may be free from the enervating dread of helpless retention. He should keep his whole economy, and chiefly the secretion of urine, in the healthiest state he can; for, like all other stammering, or even in a greater degree than any other, that of the urinary organs is influenced by the condition of the general health."

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A CASE OF PITYRIASIS NIGRA.

By George Dock, M.D.,

Professor of Medicine in the University of Michigan.

Although the occasional occurrence of brown or black patches in tinea versicolor is mentioned by most systematic writers, it does not appear that actual cases are often observed. The case of Tilbury Fox[1] is almost invariably quoted to confirm the opinion of Willan that the disease affects especially persons who have lived in hot climates. From the statements of Erasmus Wilson, Rayer, and other older writers, it can hardly be doubted that cases of chloasma and phthiriasis (as claimed by Hebra), perhaps also pellagra, have been included under the name given by Willan. This being so, the case here reported seems of importance.

D. T., aged 38, had typhoid fever at 25. Soon after recovery, brown or black spots appeared on the scrotum and breast. These have been present almost all the time since then, becoming pale at times and then again dark. When the patches become dark, the patient says, he has attacks of vomiting, with shortness of breath. He is very despondent and nervous; thinks he has some nervous disease, as the result of which the skin becomes discolored.

On stripping the patient, a well-nourished man of large frame, I found no evidence of disease of the internal organs. On the skin were numerous patches, varying in color from pale-yellow to black. Most of the patches were dark brown or black, looking as if soot had been rubbed over the surface. The patches were flat, very slightly elevated, without evidences of irritation around them. They varied from one-eighth of an inch in diameter to the size of the hand. Over the scrotum, the root of the penis, and the hypogastric region the coal-black patches were almost continuous. On the breast and arms and in the axillæ the patches were smaller, though very close in some places, as on the breast. The color on the arms and in the axillæ was pale brownish-yellow. There were no lesions on the forearms nor below the upper part of the thighs. There was not a continuous shading of color from yellow to black; the shades from brownish-yellow, like that common in tinea versicolor, to dark-brown were not represented. The patient insisted that when the dark patches came out, their appearance was sudden, and that they did not gradually become darker. This was one of his reasons for thinking the disease a nervous one, and when I told him the disease was due to parasites, he mentioned the fact as evidence against my statement.

[1] Skin-Diseases, 2d American edition, New York, 1875.

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However, it was not difficult to demonstrate the parasites. On scraping off part of a patch, it came away like the macerated epidermis of a negro cadaver, leaving a clean and not very hyperemic smooth surface. On tearing up a bit and adding caustic potash solution, I found enormous numbers of short, almost straight, brown rods lying among the epithelial cells, along with innumerable minute black or brown granules, free and in the cells. In the paler areas I found microsporon in its usual form, with many spores.

As the patient could not remain long enough, I was unable to photograph him, and as he began treatment with green soap at once, after going home, it was impossible to get one at all.

The patient said he had never used local treatment for the skin-disease, as there were no local symptoms, such as itching. He also

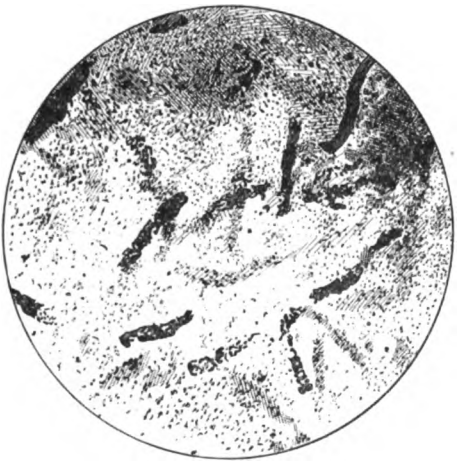

FIG. 1.

stated that he did not bathe often, but his skin was by no means filthy. He did not seem to sweat very much. He had never lived in a warmer latitude than that of Michigan.

The appearance of the fungus can be more readily understood by an examination of the figures. Fig. 1 is from a photograph by Dr. William M. Gray, of Washington, D. C., magnified 1000 diameters, (slightly reduced in the figures), and showing well the structure of the hyphæ. Figs. 2 and 3 I have drawn with the camera lucida, with a Zeiss' one-twelfth inch homogeneous immersion objective and No. 2 eye-piece, giving an amplification of 470. These show the appearance of the fungus in thin preparations. In many places the mycelium is so thick that the whole field is black. The rods are

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about as wide as the ordinary form of microsporon furfur, but not reaching as great a length. The segments are sometimes knobbed at the ends, often curved, but never branching. In only two places out of a large number of preparations could I find anything resembling spores. These are colorless, round, about the diameter of the rods themselves, and in heaps of about twelve and twenty. They are not so sharply defined and highly refracting as spores of microsporon furfur usually are. In Fig. 3 I have figured two bodies which might be taken for incomplete sporangia, but they may just as well be swollen ends of hyphæ. The rods are more or less filled with granules of yellow to black color. Sometimes, among the dark rods, one or two can be found with very little pigment. Such rods are often wider than the rest. There is no evidence of transverse division (no conidia-like bodies) other than that represented in the figures. The

FIG. 2.

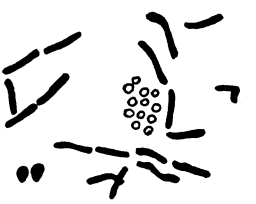

FIG. 3.

epithelial cells are filled with very minute black granules, many of which become free in the preparation. These are not affected by acids or alkalies.

It can hardly be doubted that we have to do here with a modified form of microsporon furfur, so that the term tinea or pityriasis nigra may be applied with propriety. In cultivating this fungus, various observers, notably Von Sehlen[1] and Kotljar,[2] have found that the cultures, especially those on potatoes, vary much in color, becoming brown or black. Whether the difference in the color of the mycelium has any relation with the absence of spores I cannot discover. Having to leave town soon after seeing the patient, I was not able to attempt to cultivate the organisms. Incomplete as the observation was, it has a number of points of interest which lead me to publish it.

[1] Baumgarten's Jahresbericht, 1889, p. 420.
[2] Ibid., 1892, p. 406.

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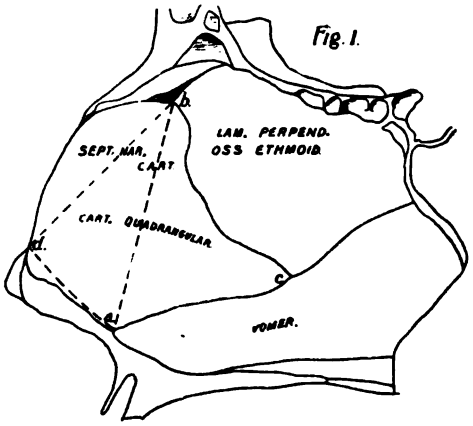
THE QUADRANGULAR CARTILAGE OF THE SEPTUM, MISCALLED THE TRIANGULAR.

By Walter J. Freeman, M.D.,

Adjunct-Professor of Laryngology at the Philadelphia Polyclinic; Consulting Laryngologist to the Pennsylvania Institution for the Deaf and Dumb, etc.

The application of the term "triangular cartilage" to the cartilaginous portion of the nasal septum has become so frequent that there seems danger of its becoming the permanent designation. As this term gives a false impression of the form of the septum, and as there is in this case especial need of exactness in anatomical description, for the septal cartilage is the portion of the septum principally affected in deviations and many other deformities, it seems advisable to call attention to the error. A teacher's daily experience, moreover, has shown this lack of uniformity to be most confusing to the student.



It is not a mere colloquial slip, but has found its way into standard rhinological works, and a physician widely known, not only as a rhinologist, but also as a thorough anatomist, has lately repeatedly made use of the incorrect term in lectures and writings. Even so great an authority as Bosworth[1] says, "The cartilages [*of the nose*] are five in number, the two upper and two lower lateral cartilages, often called the alar cartilages, and a single cartilage in the median line supporting these, the *triangular cartilage of the septum.*" Again, on page 71, he emphasizes the error as follows: "The two cavities [*of the nose*] are separated from each other in the median line by the septum, which is composed of the perpendicular plate of the ethmoid above and the vomer below. The articulation of these two bones with each other leaves anteriorly a triangular space,

[1] Diseases of the Nose and Throat, Vol. I, p. 61.

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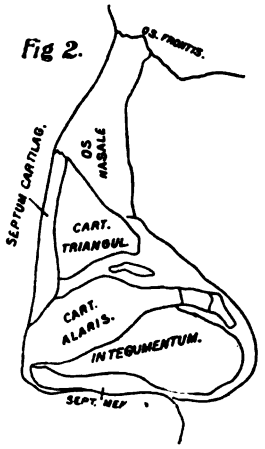
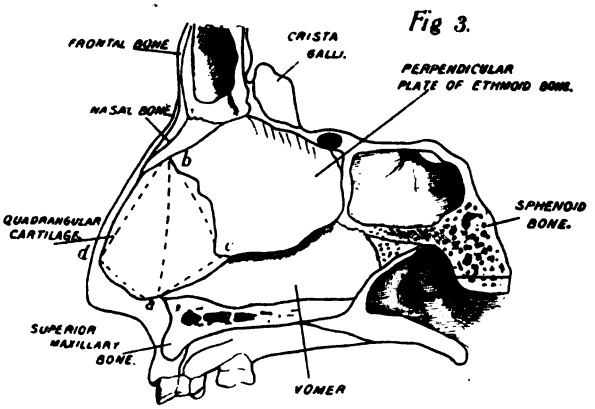
which is filled by a cartilaginous plate, *the triangular cartilage of the septum.*" If now this so-called "triangular space" were filled by a triangular cartilage, whence would come the support of the alar cartilages, of which he speaks in the first excerpt, and what would form the support of the external nose? The error seemingly arises from drawing

Fig 2.



an imaginary line, *a b* (Figs. 1 and 3), thus forming a triangle, whereas the bridge of the nose and the columna form the anatomical borders of the space *a c b d* (Figs. 1 and 3), which is, properly speaking, *quadrangular*. The term "triangular" belongs only to the upper lateral cartilages (Fig. 2), one of which is found in each ala, and nothing but the

Fig 3.



name "quadrangular" can, with anatomical preciseness, be applied to the cartilaginous plate of the septum which supports them. This is clearly shown by the accompanying illustrations, Figs. 1 and 2, taken from Heitzmann's "Anatomischer Atlas," and Fig. 3, an original drawing, half life-size.

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HYSTERICAL SYNCOPE, HEMIANESTHESIA, RAPID RESPIRATION.[1]

By Charles W. Burr, M.D.,

Clinical Professor of Nervous Diseases in the Medico-Chirurgical College.

The history of the case we shall study to-day is as follows: P. F., American, housewife, aged 40 years. Family history is negative. The patient has never had any serious illness except scarlet fever and measles in childhood, until the onset of the present trouble. Her account of herself is given with a reticence, the reason for which you will better understand later. This much, however, is clear, that in August of this year she began to have pain in the throat which, though constant, was increased by swallowing. At times she has suffered from attacks of dyspnea, pain, and distress in the region of the heart, extending to the left shoulder, but never affecting the arm and not accompanied by fear of death. Occasionally there are slight vertiginous attacks caused only by a sudden change of posture. On August 7, while at a picnic, she suddenly fell unconscious, and remained so for more than an hour. Since then she has had twelve or thirteen similar attacks. We know nothing concerning her condition when in them. A few weeks ago the throat pain became so annoying that she consulted Dr. Cleveland. On examination he found a slightly prominent right tonsil, and on the anterior aspect of it a little sac filled with granulations, around which was an area of slight inflammation. This spot was exquisitely tender to touch, the pain extending throughout the side of the head and face, so that he applied a 10-per-cent. cocaine solution. In a few minutes, to his great surprise, she suddenly grew pale, sank unconscious in the chair, and breathing became very shallow. After a few minutes she rallied for a time, only to again become unconscious. She was slightly cyanosed about the lips. Respiration seemed to cease altogether. The heart was weak and fluttering and the pulse scarcely perceptible. The doctor, having no knowledge of the remarkable history you are about to hear, thought, of course, that it was an instance of extreme susceptibility to cocaine. The patient's condition was so alarming that stimulants were injected and artificial respiration kept up for some time. After several hours she recovered. A few days later Dr. Cleveland sent her to this clinic.

Examination reveals the following condition: A well-nourished, but flabby, apathetic, middle-aged woman. There is, as you see, complete analgesia of the right arm and leg. I may stick in a pin where

[1] A clinical lecture delivered at the Medico-Chirurgical Hospital, November, 1894.

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I will and as deeply as I will without eliciting the slightest evidence of even discomfort. Pain sense on the right side of the face is diminished but not abolished. Touch is not felt at all on right arm and leg and scarcely on the right side of the face. Deep pressure is felt as a touch on arm and leg, but cannot be localized. It is noteworthy that the existence of these sensory symptoms was unknown to the patient until we examined her. Their reality is proven by the fact that soon after the first examination the nurse came upon her unawares and found her much interested in testing herself. It also is noteworthy that, though, as you have seen, a touch on the right hand is unfelt, yet if I tell her to lift a glass above her head she still holds it after the hand passes out of the field of vision. In organic anesthesia this would scarcely happen. On the contrary, so soon as the eyes were unable to keep watch upon the hand and give warning, if one may say so, to the patient how much muscular effort to put forth in order to retain the grasp, the muscles would relax a little and the glass fall. Notwithstanding the anesthesia, there are certain points on the right side of the face which are very painful on pressure. We will find them on the supra- and infra-orbital notches, over the pes anserinus, and on the great occipital nerve. Pressure on the abdomen, over the ovarian region, so called, results in nothing. There is no mammary pain and but little spinal tenderness. The grasp of the right hand is weak and all movements of the arm are very slow. If I ask her to hold the right arm extended it remains so for a moment, and then slowly and deliberately sinks to the side. Notice also that as the arm is moved a rather coarse and very irregular tremor develops in it, which increases as we talk about it, and has, on previous occasions, disappeared entirely when the mind was fixed upon something else. There is no true palsy of the arm nor any ataxia. Slow as all movements are, yet, notwithstanding the tremor, objects are picked up and the nose or ear touched perfectly at the first attempt, the eyes being either open or closed. Station is good. The gait is good, though, as she lies in bed, there is awkwardness and apparent weakness in the movements of the right leg. The knee-jerk and biceps-tendon jerk are normal on both sides. Ankle clonus is absent. There is no wasting or rigidity in the arm or leg.

She is now breathing forty-eight times to the minute, the respirations being regular but shallow and upper costal in type. Her breathing rate varies greatly, reaching sometimes as high as sixty, and then suddenly falling to normal. It changes many times in the day, and has never been accompanied since we have known her by dyspnea. Percussion and auscultation reveal no sign of lung-disease.

The pulse averages 80 per minute and varies little. The apex-beat is not visible and is scarcely palpable in the fifth interspace a little

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to the right of the nipple line. The heart-sounds are faint but there is no murmur. The area of dulness is normal. In short, cardiac examination is entirely negative. The abdominal organs are normal. Albumin and sugar were absent in all of several specimens of urine examined. The specific gravity averaged 1020. Tube casts were absent.

At first the patient said nothing about any difficulty of vision, but after much examination,—and, I must confess, she has been studied more than good therapeutics would justify,—she began to complain of dimness of vision of the right eye. When, however, Dr. Fox attempted to take her color fields for me, she dropped unconscious on looking at the fixation point, and the examination was, of course, fruitless.

This tendency to attacks of unconsciousness, which is by far the most interesting element of the case, I have purposely left to be considered last. The first attack of which we have any accurate knowledge occurred during the probing of the tonsil. On my first examination, while pressing upon one of the tender points spoken of above, she suddenly grew pale, sank to the floor with a moan, grew slightly blue about the lips, and apparently—mind, I say apparently—ceased breathing altogether. At all events the abdomen and thorax were absolutely motionless. The radial pulse was scarcely palpable, and the heart-sound weak and irregular. In about a quarter of an hour she recovered suddenly and completely, except that she was dazed, mentally confused, in a sort of dream state for some time. I have repeated this experiment, but for obvious reasons do not desire to do so now. Once since in the hospital, she has had an attack of spontaneous unconsciousness.

She is markedly susceptible to hypnotism so far as the production of unconsciousness is concerned. When told to look at my finger, without any suggestion to sleep, unless, indeed, she has been hypnotized before without my knowledge, and hence knows what to expect, she will in a minute or less become unconscious without change in cardiac or lung function, except that the respiration-rate is reduced to normal or somewhat less. There is no cyanosis, or cataleptic rigidity. The reflexes remain normal except that the rather widely dilated pupils do not react to light. She is easily awakened by sharp pricking with a pin or calling to her, but resents being disturbed, and if left alone may sleep for hours. All attemps to make her subject to suggestion fail utterly, as they have failed in almost every case of hypnotism I have studied. Indeed, there is room for grave doubt as to the willessness of cases of alleged induced susceptibility to suggestion. The possibility of fraud is tremendous; the safeguards against it are few.

The appetite is good, bowels regular, and menstrual function normal.

With this long history of remarkable events and curious grouping

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of symptoms, referable to many organs, the diagnosis is easily made. It is a case of hysteria. No single organic lesion, indeed, no combination of organic lesions, will explain the symptoms, and multiplicity of non-related symptoms always points towards hysteria. Never forget, however, what I have told you so often, that hysteria should never be hurriedly diagnosed, should never be diagnosed till all possibility of organic or non-hysteric functional disease is excluded. This is the more important since hysteria is so frequently superadded to an organic affection. Let us go over the case then step by step and carefully. First the syncopal attacks. One thinks first of the heart itself. But here we have no evidence of organic disease. There certainly is no affection of the valves, and fatty degeneration, though it may be extensive without causing symptoms, certainly is not characterized by syncope from pressure upon a tonsil or over the facial nerve. The patient's statement that she is subject to attacks of cardiac pain running to the left shoulder and accompanied by dyspnea and faintness recalls angina pectoris. But true angina is rare in women and dyspnea is absent. The attack is short, and, though arterial tension may be increased, the pulse-beat is apt to be uniform and regular. In the vasomotor angina of Nothnagel there is pallor and cyanosis, faintness, and even unconsciousness. Our patient's description does not agree with either of these, but bears rather the ear-marks of one of the forms of hysteric angina. The syncopal attacks seen by us are parallel to the convulsions produced so frequently by pressure over a hysterogenetic zone. That the cocaine had any causative relation to the first attack is extremely doubtful. Indeed, it is certain that some of the reported cases of supposed cocaine poisoning, after local applications to the throat, were in reality hysteric.

The respiration will repay a little study. It averages, as we have seen, 48, sometimes reaching 60, and is very variable. One would expect the pulse-rate to vary in the same way, but, curiously enough, it is remarkably stable. This lack of relation between pulse and respiration is characteristic of hysteria, while in organic disease respiratory increase is usually accompanied by cardiac overaction. Further, while the breathing is so shallow and entirely upper costal in type, there is no dyspnea. Lastly, the respiratory tracing is perfectly uniform and regular. The inspirations are all of equal depth. The line drawn through the apices of the tracing is parallel to the base line. All this is a strong disproof of fraud. At all events, in some experiments I made for Weir Mitchell several years ago, in which the subjects were told to mimic as closely as possible a case of hysterical rapid respiration shown to them, none were able to do so. In every case a series of shallow respirations was followed by one or more deep inspirations,

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caused by the imperative need for air, and, consequently, the tracings were all very irregular. I am not prepared to say that by long practice one could not learn to do this thing. Finally, it is remarkable that in this case, as in so many others, the patient paid no attention to the abnormality of breathing until we spoke to her about it. I ought, perhaps, to warn you that you may have irregular breathing and dyspnea in hysteria.

The hysteric nature of the one-sided sensory defect and weakness is proven by the absence of any signs of organic brain-disease competent to produce them.

MEMORANDA.

NOTE ON ERRORS IN PRACTICE IN THE MATTER OF URINE EXAMINATIONS.

SEVERAL weeks ago I was asked by a medical friend to examine a sample of urine and estimate the amount of urea with a view to determining the propriety of a surgical operation, as there had been albuminuria and evidence of renal insufficiency. I responded, and reported an amount of urea somewhat below the normal. A few weeks later I met my friend and asked whether the operation had been done. He said no, that Dr. —— (mentioning the name of a distinguished surgeon) was anxious to increase the urea somewhat before he did the operation. I asked what they were doing to this end. He replied that the patient was at rest, on milk and other diet containing a minimum of nitrogen. Now the course adopted by my friend in the allowance of food which was of low nitrogen percentage was the very one which must be followed by lower urea secretion, and the more literally he carried out his purpose the less urea would he find in the urine, and the operation must be indefinitely delayed if it is not to be performed until the urea secretion is raised.

The urea excretion by the kidney is in the main a measure of nitrogen ingestion in albuminous foods. The less nitrogen that is taken in the less urea will be separated by the kidneys. This method, therefore, of testing the urea eliminating power is the very opposite of that which should be pursued. If we wish to test the urea-secreting power, and therefore the integrity of a pair of kidneys, our plan should be to give nitrogenous food, represented by meat and eggs, and then,

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by determining the amount of urea in a portion of the twenty-four hours' urine, ascertain whether elimination increases *pari passu* with the nitrogen ingestion. If it does, the kidneys are doing good work; if not, they are defective, and the propriety of an operation may be questioned.

Another error, the practice of which I have perhaps more than usual opportunity to note, is that of physicians, in asking for a sample of urine for examination, to request a portion of that passed *on rising*. This is a remnant of an old practice adopted at a time when we were not familiar with the very marked differences in the amount of abnormal constituents, especially albumin and sugar, in the urine of fasting as compared with the food-urine and that passed after exercise, and has led, to my knowledge, to very serious errors in diagnosis. As it is usually inconvenient to get a portion of the twenty-four hours' urine, and as this method to be of value should in all instances be carried out, while urine thus preserved is often unfit for microscopic examination on account of decomposition, the most practicable plan is to take a part of the urine passed on going to bed at night and a part of that passed on rising for examination by the microscope and for albumin and sugar analysis. This gives us at once a sample of the best and the worst, and the result of an examination of these two specimens is really more satisfactory, so far as albumen, sugar, and morphological elements are concerned, than a part of the twenty-four hours' secretion. It is true that for the urea analysis it is almost necessary, in order that we may get a correct notion of the twenty-four hours' secretion, to take a part of the twenty-four hours' urine, because of the great variation in the percentage of urea in the urine passed at different times of the day.

JAMES TYSON, M.D.,
Professor of Clinical Medicine, University of Pennsylvania.

REMARKABLE VITALITY OF A NEW-BORN CHILD.

I DESIRE to report a remarkable case of vitality of a new-born, which came under my observation during October, 1894.

An illegitimate female child was abandoned by its mother, being left at the bottom of a cess-pool vault, where, she claimed, ten hours before my visit, it had been accidentally dropped during an attempt to micturate. The infant lived, despite the following facts:

(1) Its delivery from a 16-year-old, ignorant, inexperienced negress, unattended by any one. (2) Its cord not tied. (3) Its fall of twelve feet down the pit. (4) Its ten hours' exposure in the cess-pool. (5) Its smothering by foul air, also a heavy covering of rags, paper,

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and straw. (6) Its pounding by three bricks which fell indirectly from eight feet above. (Some loose bricks were accidentally dislodged from the sides of the vault by my maneuvres to extricate the infant.) (7) Its lowered temperature previous to applications of hot bottles, blankets, and administration of cardiac stimulants.

Next morning the child was perfectly well, and some two months afterwards appeared in court as evidence in the case.

ARTHUR W. BOOTH, M.D.,
Resident Physician, Howard Hospital, Philadelphia.

CLINICAL DEPARTMENT.

SYPHILIS OF THE PHARYNX: AN ERROR IN DIAGNOSIS.

[Dispensary for Genito-Urinary Diseases, University Hospital.]

THE following case of syphilis of the pharynx, while illustrating no new features of the disease itself, is interesting and instructive by reason of a rather curious error in diagnosis made in connection with it. J. M., aged 53, laborer, presented himself for treatment at the Dispensary, March 7, 1893, complaining of sore throat. No history of chancre could be elicited. The only form of venereal disease acknowledged by the patient was a discharge from the urethra, lasting one month, which he stated that he had four years previous to his visit to dispensary. No chordee or ardor urinæ accompanied the discharge. There was no history of subsequent eruption, alopecia, or sore mouth. Examination of body negative. No scars on skin or pigment stains from old eruptions. There were two slightly enlarged glands in each groin; no enlargement of post-cervical or epitrochlear glands; no alopecia and no eruption on body.

Examination of throat revealed an elongated, irregularly-shaped, slightly-excavated, sloughing ulcer in the median line on the posterior wall of pharynx. The ulcer was one and a half inches in length, and about three-quarters of an inch wide, with sharply-defined edges; no inflammatory areola, and resembled very much in appearance an immense chancroid.

The diagnosis of tertiary syphilis of the pharynx was made, and appropriate treatment instituted, consisting of hydrarg. biniodid., grain 1-24, potassii iodid., grains v, t. i. d.

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March 14. Ulcer on pharynx somewhat larger, also present a circular, sharply-punched-out ulcer on right tonsil. Treatment, hydrarg. biniodid., grain 1-12, potass. iodid., grains 10, t. i. d.

March 24. Both ulcers entirely healed. Continue treatment as above.

May 10. Has had no treatment for one month. Returns to dispensary with small excavated ulcer on left tonsil. Ordered mixture of March 14.

May 24. Ulcer on left tonsil healed; no other lesions in mouth or throat; to continue treatment.

This case, representing as it does a form of syphilis not uncommonly seen in this dispensary, would be entirely devoid of interest were it not for the rather startling experience undergone by the patient before he came under our care.

According to his statements, in the early part of December, 1892, during a rather widely-spread epidemic of diphtheria in the city, he consulted a physician in regard to a sore throat which he had had for several days.

He was very positive in his assertion that, with the exception of some soreness in the throat, he did not at this time, or at any subsequent period, feel at all ill. He was, therefore, considerably astonished upon being told by his physician that he had diphtheria, and that he should go at once to the City Hall and procure a permit admitting him to Municipal Hospital. This he accordingly did, and the daily papers on the following day published a very graphic account of the visit to the health office of a man suffering with diphtheria, and the consternation created among the clerks by this decidedly unwelcome visitor. The offices and elevator were immediately fumigated and thoroughly disinfected. Our unfortunate patient was admitted to the Municipal Hospital December 8, 1892, and remained there under treatment for diphtheria for two weeks, at the end of which time he was discharged as cured.

He stated that during this period he did not at any time feel ill. One month after his discharge from hospital he returned again with another attack of sore throat, supposed to be a "relapse." It would appear from his story that during this second stay in the hospital the true nature of the trouble was surmised, for upon being again discharged he was informed of the fact that he had "chronic blood-poisoning," and was referred by some one to the University Dispensary. The differential diagnosis between syphilis of the throat and diphtheria is a point not at all touched upon by writers upon these subjects, probably for the reason that it was hardly thought necessary.

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Mackenzie, in his article, "Syphilis of the Upper Air-Passages," Morrow's "System of Genito-Urinary Diseases," Vol. II, states that "typhoid fever, diphtheria, etc., may lead to destruction which resembles that of syphilis so closely as to render an appeal to the history of the case imperative."

To the best of my knowledge no other authority has thought it necessary to call attention to the possibility of confounding these two diseases; and it was this very error in diagnosis that added so much interest to what would otherwise have been a very ordinary case. Notwithstanding the absence of any history of chancre or previous eruption on the body, the appearance in the throat at the time of the patient's first visit to the dispensary was manifestly that of tertiary syphilis of the pharynx. I fail to see how it could have been possibly mistaken for diphtheria. There was no rise of temperature, no glandular involvement. The lesion in the throat was an ulcer with sharply-marked edges, not covered with false membrane, and looking, as I mentioned before, more like a chancroid than anything else.

The initial lesion in the case had probably been located in the urethra at the time he had the urethral discharge four years prior to his visit to Dispensary. The entire absence of ardor urinæ and chordee at that time would point to the discharge not having been a gonorrhea. As in all cases of suspected syphilis, the result obtained from treatment in this case proved very satisfactorily the correctness of the diagnosis.

The man's improvement while under treatment at the Municipal Hospital was in all probability due to large doses of calomel or bichloride of mercury taken for diphtheria.

H. M. CHRISTIAN,
Chief of Genito-Urinary Dispensary.

TUBERCLE BACILLI IN BLOOD.

At a meeting of the Verein für Innere Medicin, in Berlin, Krönig reported the finding of tubercle bacilli in blood of a person who had died of acute miliary tuberculosis (*Cf. Deut. med. Woch.*). As tubercle bacilli are usually difficult of detection in the blood, he describes the method employed, and recommends it highly. A few drops of the blood were thoroughly shaken with about ten cubic centimetres of distilled water until a brownish-red transparent liquid resulted. This was then settled by means of the centrifugal machine, and the sediment was examined for tubercle bacilli by the ordinary method. In all of four cover-glasses made and examined by Krönig bacilli were found.—*American Journal of the Medical Sciences.*

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ALUMNI NOTES.

The Laying of the Corner-Stone of Houston Hall.

The corner-stone of the students' hall, which is to be known as Houston Hall, was laid on Thursday afternoon, December 21, 1894. The ceremonies opened with prayer by Bishop Whitaker, after which all joined in the Lord's Prayer. Provost Harrison then spoke as follows: "In one aspect I take this to be the most important occasion in the history of the University, for it marks the first practical step that has been taken to provide for university student life. Up to this time, as is known to every one of you, no student of this University has had a place to set his foot outside of the recitation room. Through a great benefaction we are enabled to make a beginning to change all this, and from this beginning to-day I hope that we may go on to the end and not consider our work done until the University of Pennsylvania can offer university life, under one form or another, to every student who may come to it."

At the close of Provost Harrison's remarks, Mr. J. Vaughan Merrick, representing the Board of Managers of Houston Hall, delivered the address of the day. He said in part:

"The occasion on which we are assembled marks a distinct and important era in the life of the University. These walls which surround us are silent yet eloquent witnesses to her material growth. They are the outward, visible signs of the enlargement of her teaching power, the diversification of her methods, and the expansion of her influence upon the community. More than this, they mark the gradual, yet constant, process of transition which has changed her from being, in fact, merely a *college* to a university.

"A quarter of a century ago, in the days when two schools, one collegiate the other professional, existed side by side on Ninth Street, scarcely united except by a common name and Board of Trustees, the University was yet in embryo. When one refers to the present number of her faculties, to the diverse branches of learning now offered to her students, and to the unification which has taken place in the government of this complex organization, and considers that the transition to which I have referred has been effected in less than the lifetime of some of her undergraduates, the most captious critic must acknowledge the wonderful advance which the University has made in providing extended facilities for study and for application of its results in practical work."

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Mr. Merrick then went on to relate how, one by one, the buildings had been erected without ceremony or ostentatious effort; how the faculty increased from 37 professors and instructors to 237, and the students from 660 to nearly 2400, making the University, by this phenomenal growth, rank next to Harvard in point of numbers. He also dwelt on the benefit of physical improvement and the formation of character by social and religious influences. In the physical improvement, he said, the University has attained a foremost place by her triumphs in athletics.

It is, however, Mr. Merrick said, in relation to the social side of her life that this building is now being erected, and he gave a brief sketch of the movement as started by the students in the spring of 1893.

In conclusion, Mr. Merrick said, "Surely no memorial could be conceived of more appropriate to its object, or more useful in its application. While its fabric shall endure the name of Henry Howard Houston, Jr., will be associated with his beloved alma mater in a way which will endear his memory to the countless students who will hereafter enjoy this house. It will be the Home of the University, and will stand for all which that name imparts, so far as can be the case in any public institution. And, as its corner-stone is laid to-day, let us trust that upon this foundation 'peace and happiness, truth and justice, religion and piety may be established,' in this University, 'for all generations.'"

Rev. Dr. Theodore S. Rumney, rector of St. Peter's Protestant Episcopal Church, Germantown, where the Houston family attend, in a short address spoke in high terms of the object for which the building is to be erected, and eulogized in glowing terms the Christian life and example of the young man in whose honor the hall is named.

Provost Harrison then announced the mementoes which were placed in the stone.

Bishop Whitaker then took the large stone hammer in his right hand, and, hitting the corner-stone three times, invoked God's blessing in the name of the Father, the Son, and the Holy Ghost.

Appointments.

Dr. Adam Shirk, of the class of 1862 of the University of Pennsylvania, who, for the last five and a half years, superintended the management of the Alameda County Hospital and Infirmary, resigned as superintendent and resident physician December 1, and was immediately elected to the position of visiting physician and surgeon.

During Dr. Shirk's administration this institution was the most economically and satisfactorily-managed hospital and infirmary on the Pacific coast.

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At a recent meeting of the Board of Trustees of the Methodist Episcopal Hospital, Philadelphia, Drs. Richard C. Norris and George Shoemaker were appointed visiting gynecologists.

Dr. J. P. Arnold, of the class of '93, has been appointed superintendent of the Presbyterian Hospital in Philadelphia.

At the last meeting of the Board of Managers of the Howard Hospital, Dr. William Campbell Posey was elected ophthalmologist.

Necrology.

Dr. Charles S. Boker, of Philadelphia, died at Atlantic City, on December 30, 1894. He was born in Philadelphia in 1827, graduated from the University, and completed his studies in Paris and Heidelberg. He was for many years on the staff of St. Joseph's Hospital. Dr. Boker was a member of the College of Physicians, Academy of Natural Sciences, and the Historical and Biological Societies.

Dr. James E. Rhoads died suddenly at Bryn Mawr, Pa., on January 2, 1895. Dr. Rhoads was born in Marple Township, Delaware County, in January, 1822. He received his academic education at the Westtown Friends' Boarding School, in Chester County. After graduating he spent a portion of his early manhood in teaching in the schools of Philadelphia. Afterwards he entered the Medical Department of the University of Pennsylvania, and, after receiving his diploma, he served a term as a resident physician at the Pennsylvania Hospital. Later he practised his profession in Germantown, but failing health caused him to relinquish his duties.

In 1883 he was elected president of Bryn Mawr College. He remained at the head of the College until last summer, when delicate health caused him to tender his resignation. At the time of his death, however, he occupied the chair of ethics in the College, and was also president of the Board of Trustees. For years he was editor of the *Friends' Review*, now known as *The American Friend.*

As a Friend, Dr. Rhoads was probably more widely known and loved than any other man in this country and in England. Of a singularly modest and retiring disposition, he yet won the friendship of all with whom he came in contact by his sympathetic manner and lovable characteristics.

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EDITORIAL.

CASTRATION IN HYPERTROPHY OF THE PROSTATE GLAND.

WHEN Dr. J. William White first suggested to the profession the operation of castration for the relief of hypertrophy of the prostate gland (Address at the Annual Meeting of the American Surgical Association, June 1, 1893, *Annals of Surgery*, August, 1893) on theoretical grounds, although strongly supported by experimental evidence, it is doubtful whether any one appreciated the full value of the recommendation. Cases of prostatic hypertrophy are of extreme frequency. Sir Henry Thompson found that one man of every three over 54 years of age examined after death showed some enlargement of the prostate; one in every seven had some degree of obstruction present; while one in fifteen had sufficient enlargement to demand some form of treatment. In this country to-day, as shown by the last census, there are more than three millions of men over fifty-four; of these, according to Thompson's estimate, which genito-urinary specialists consider a conservative one, about two hundred thousand are sufferers from hypertrophy of this gland. This number seems very large, but the assertions of Thompson unquestionably express a general rule, and in fact every surgeon must have seen men in whom some prostatic overgrowth existed *before* the fifty-fourth year. The lives of such patients are threatened because, if the obstruction is not removed, the health is rapidly undermined by the retention of urine and the consequent fermentative changes, the deleterious influence of backward pressure on the kidneys, the frequent use of the catheter, and the loss of sleep incident to the incessant demands to void urine. Heretofore the surgeon has been unable to afford distinct relief from the distressing symptoms of an advanced case of this affection. If the patient's general condition would warrant the very considerable risk, some form of prostatectomy was performed. The suprapubic method was recommended for a time, but the difficulties encountered in its performance, the frequency of suprapubic fistula as a sequel, and the high mortality following the operation have led to its almost total abandonment. Perineal prostatectomy is also attended with considerable risk, on account of the free hemorrhage, which cannot be controlled during the operation, and the pro-

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longed anesthesia which is necessary. In addition to this, the operation is a bungling one, in which the enlarged gland is removed by cutting, scraping, or gouging, while the instrument is out of sight, and much of the time it cannot be guided even by the finger. Combined suprapubic and perineal prostatectomy enables the operator to reach and enucleate the gland with greater freedom, but it is an operation of such gravity that it would be contraindicated in the very cases in which the demand for relief was most urgent.

Perineal prostatotomy is little more than a palliative measure, which does some good, temporarily, by draining the bladder and inducing slight contraction of the middle lobe of the prostate in the healing process. All of these operations confine the patient to bed for several weeks, which is, in itself, objectionable, and in addition require the use of the bougie for a long time afterwards.

In view of these facts it is not strange that surgeons should have presented Dr. White's suggestion to patients suffering from the consequences of prostatic hypertrophy, nor is it unnatural that such patients accepted this chance for relief from a condition that in many cases was rapidly and surely impairing the health of a person otherwise vigorous and, apparently, without this trouble destined to enjoy many additional years of life.

With the testes already or soon to become functionless, and with the contemplation of a long period of intense suffering which will be relieved only by death, sentimental objections pale into insignificance, and the problem of securing relief without placing the life in danger is the only one entitled to consideration.

Cases of castration based upon Professor White's deductions soon began to be reported. Ramm, of Christiania, Norway, recorded two in September, 1893; Haynes, Los Angeles, Cal., and White, Philadelphia, each report three cases; Finney, Baltimore, reports two cases; Smith, St. Augustine, Fla., Powell, London, Mayer and Haenel, Dresden, Moullin, London, Thomas, Pittsburg, Ricketts, Cincinnati, Swain, Bristol, England, and Bereskin, Moscow, each record one case. Thus far eighteen operations have been published. All have been more or less successful, and usually the relief from the distressing symptoms and the shrinking of the prostate have been marvellous. The least favorable cases have experienced infinitely greater relief than has been obtained by any method heretofore employed. At least as many unpublished cases have been operated upon with equally favorable results. There have been no deaths from the operation: of course, few would be expected in the hands of competent surgeons.

To those familiar with these cases, the rapid shrinking of the prostate and the simultaneous relief afforded the patient have been

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truly wonderful. The operation has therefore passed the experimental stage, and has legitimately established for itself a position among the most successful of operative procedures. Indeed, the results have been so uniformly favorable that castration may now be considered a specific for hypertrophy of the prostate.

It is necessary, however, to utter a word of caution here. Castration is not indicated in every case of prostatic enlargement or urinary obstruction. To secure uniformly successful results one must be certain that the condition from which the patient is suffering is appropriate for the operation. Cases of prostatic abscess, prostatitis, tumors of the prostate and of the region of the neck of the bladder, and other forms of obstruction in the neighborhood of the prostate must be distinguished from true prostatic hypertrophy. Without careful discrimination, both the surgeon and the patient will be disappointed, and the operation will unnecessarily be brought into discredit.

As it stands to-day, however, in appropriate cases, it appears to mark an advance in the surgery of the prostate, which, when the gravity and the frequency of the condition of hypertrophy are recalled, together with the more or less ineffectual and always dangerous methods of treatment which have prevailed, must be a source of congratulation not only to Professor White but to the profession at large, and to thousands of patients who, having outlived their sexual lives and earned an old age of mental and physical repose and intellectual enjoyment, have had only a few short years of torment and misery to look forward to on account of this hitherto intractable disease.

THE CELESTIAL METHOD OF DETECTING OPIUM.

In the forty-second issue of the "Chinese Imperial Maritime Customs, Medical Reports," published at Shanghai, Dr. George R. Underwood gives an interesting account of the medico-legal method employed by the Chinese mandarin for the detection of opium in the corpse of a person alleged to have died of the poison. We commend it to our chemists for its novelty and the ease of its carrying out; leaving its accuracy to the test of time, experience, and medico-legal wisdom.

There had been sorrow and confusion in the family of Huang-Hu. The mother, a woman (for even in China the mothers are women), was dead. The questions were, why did she die? how did she did? and, perchance, by whom did she die? So the court of the mandarins was assembled. Under the stern direction of the mandarin judge, the mouth, nostrils, vagina, and rectum of the unprotesting corpse were tightly plugged with wet paper, and two probes of untarnished silver,

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about twelve inches long, were passed for nearly their full length,—one into the rectum, the other into the mouth. Next, the head and trunk were wrapped in sheets of wet paper, the whole body enveloped in quilts, and boiling water, kettleful after kettleful, was poured as quickly as could be procured over the corpse. The temperature was 95° F. in the shade; the afternoon sun was broiling hot; dinner had been postponed; no wonder the temper of the Chinese mandarin was only prevented from boiling over by a series of acrid remarks to the corpse, the attendants, and the world in general. The pouring and the objurgations went on *pari passu* for an hour and a half, when the face was uncovered, and the probe passed in through the mouth found to be untarnished. After sundry headshakings and expostulations, the probe was replaced; again the stream of heated water and heated words splashed on the by-standers until another fifteen or twenty minutes had passed, when the mouth probe was again brought to light; and in its blackened surface celestial wisdom read the story of opium poisoning; a story which received further confirmation, when from the uncovered swollen body the rectal probe was taken out and found badly stained.

After it was shown that the woman truly was dead of opium, the hunt grew hot for the author and source of the poisoning. The sleuth-hounds of the Law Department of the University may well be interested in the unwindings and outgoings of the court hereafter; but for the medical man the interest of the case ceases with the determination of the death; and so, as with the Lady and the Tiger, we leave unsolved the why, the wherefore, and by whom the death came.

THE POSSIBLE INFLUENCE OF HIGH ALTITUDE OVER VISION.

THE influence of climate in the production of ocular disturbances has been recognized for a long time. It is to be noted, for example, that the relative frequency of the various diseases of the eye is widely different in different parts of the world. The malarial affections of the eye are now well recognized, and a number of cases have been reported. Rheumatic complications are even more frequently observed than are the malarial. Both of these forms would naturally depend upon climatic conditions. The influence of high altitudes upon vision has, however, not been the subject of any systematic study. Attention has recently been called to the subject, by Dr. S. D. Risley, in a very carefully reported case, in which the possible relation between the high altitude and the loss of vision is strikingly illustrated (*Interna-*

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tional Medical Magazine, March, 1894). The patient was a woman, residing in Colorado Springs, whose vision suddenly failed, first in one eye and then in the other, until it was almost lost on the right side, and entirely lost on the left. In this condition she came to Philadelphia, and examination showed the vision to be $\frac{5}{200}$ on the right side, and $\frac{3}{200}$ on the left side. During her stay in the East, the treatment consisted of general tonics and residence at the sea-side. The vision steadily improved, so that at the end of five months it was on the right side $\frac{6}{6}$, and on the left $\frac{6}{7.5}$. During all of this time the left optic nerve was distinctly green, while that on the right side was gray-green, giving the appearances of optic atrophy. It would be most interesting to know what was the chief factor in bringing about the restoration of vision. Such a signal improvement in a case of this kind from a general tonic treatment is probably unknown, and one is unavoidably compelled to seriously consider whether it was not the influence of the residence of the patient on the seaboard. She returned to Colorado Springs, and five months later her physician reported that there had been no tendency to a recurrence of her visual disturbance, and no change in the ophthalmoscopic picture.

It may be added that a very careful study failed to discover any cause for the condition of the eyes; and, as the change of residence from Colorado Springs to the Atlantic seaboard was followed, without special treatment, by the restoration of normal vision, the probability of climatic influence in the causation of the disease seems most reasonable.

School Ophthalmia.

The fifth annual report of Mr. Sydney Stephenson to the Central London School District gives a summary of the excellent work which has been done in preventing the spread of diseases of the eye among the children of London. In 1889, soon after the school was opened, the numbers under treatment formed 33 per cent. of the total school population, while in June, 1893, the numbers had sunk to 7 per cent. The benefits of such an institution to the children themselves are very great; instead of remaining idle inhabitants of the infirmaries they undergo a course of instruction differing little from the ordinary education code of the poor-law schools. Mr. Stephenson expresses his conviction, based on experience, that there is no danger of increase in the intensity of the ophthalmia by the congregation of the patients together, if the wards are properly constructed and not overcrowded.—*British Medical Journal.*

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MEDICAL PROGRESS.

MEDICINE.

UNDER THE CHARGE OF

WILLIAM PEPPER, M.D., LL.D., AND JAMES TYSON, M.D.,

ASSISTED BY

M. HOWARD FUSSELL, M.D.

Dilatation of the Right Ventricle.

T. Stacey Wilson (*Birmingham Medical Review*, September, 1894) says that post-mortem study shows that the main change in failure of the right heart is an increase of the right ventricle *upward* and to the *left*. This upward increase may be so great that the pulmonary valves lie under the first left interspace or even under the first rib, while the left ventricle may extend nearly or quite to the nipple line in the second left interspace. Increase to the right plays, as a rule, only a secondary part as compared with that in an upward direction. This statement holds good for cases where there is valvular disease as well as for those where there is none. Together with this change there is a displacement of the whole heart upward and some rotation of the organ, so that the left ventricle assumes a position rather more posteriorly than normal, while the apex is tilted upward and outward, and is often brought in the fourth interspace in or external to the left nipple line. In the adolescent type of dilatation the increase in size is upward and to the left, giving an increased area of relative cardiac dulness in the third, second, and sometimes in the first left interspaces. In the adult type there is usually some increase of cardiac dulness to the right of the sternum, though it is usually less than the upward increase. Inspection and palpation show cardiac pulsation in the second and third left interspaces, and this pulsation is not powerful like the apex-beat or an aneurism, but has a characteristic wavy appearance. We must depend on relative dulness, obtained by percussing the heart while the chest is held in position of full expiration. In adolescent cases the dulness to the left of the sternum is usually increased when the patient lies down. In these cases the area of relative dulness increases upward to the second interspace and broadens outward and downward to the fourth interspace until in advanced cases the left edge of the dulness almost coincides with the left ventricle. The superficial cardiac dulness broadens and extends upward. It rarely extends to the right of the sternum. Auscultation gives (1) the well-known pulmonary systolic murmur usually heard best in the second left interspace; (2) accentuation of pulmonary second sound, occasionally true reduplication of the second sound at the base of the heart; (3) the venous hum so well known in cases of anemia; (4) the murmur due to tricuspid regurgitation; (5) a false reduplication of the second sound, audible only over the ventricle, and constituting one of the varieties of *bruit de galop;* (6) more rarely still a tricuspid diastolic murmur: of these

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murmurs the pulmonary systolic is the most common, and is of considerable diagnostic value in the dilatation which occurs as a result of overstrain with or without anemia in adolescence. This murmur is often the first sign of dilatation of the right ventricle. The exact cause of this murmur is not certain, but seems to be due to the upward displacement of the anterior portion of the root of the pulmonary artery. The venous hum usually associated with anemia, which is heard at the root of the neck over the great veins, is intimately related to failure of the right ventricle. From a clinical point of view it is difficult to point to any physical sign which makes the presence or absence of tricuspid regurgitation in any particular case. The most reliable signs are (1) the presence of systolic murmur (*a*) over the body of right ventricle, or (*b*) over the right auricle, or (*c*) over the situation of the superior vena cava just to the right of the sternum in the first and second interspaces; and (2) the presence of a true systolic pulsation in the veins of the neck.

Symptoms.—The symptoms of dilatation of the right ventricle are dyspnea, palpitation, etc. Detection of this pulsation, together with the displacement of the apex-beat upward and outward, is often all the physical examination necessary for the diagnosis of a dilated right ventricle. In addition, there will usually be noticed pulsation in the veins of the neck. Frequently the shock of the closure of the pulmonary valves can be clearly felt in the second interspace, and in extreme cases a true systolic thrill not due to valvular disease. Pulsation may also be noticed to the right of the sternum and in the epigastrium. Percussion aided by auscultation is often the only means by which you can make an early diagnosis of dilatation of the right ventricle.

The one symptom which is fairly distinctive of this condition is pain localized to the region of second and third left costal cartilages. The pain may be acute, but is usually dull and accompanied by a sense of tightness in this region. Failure of the right ventricle will result from (1) excessive work thrown upon the normal ventricle; (2) normal amount of work upon a weakened ventricle. The most typical examples of the first class are due to excessive athletics or excessive work.

Treatment of Chronic Pleurisy.

Dujardin-Beaumetz (*Bulletin Général de Thérapeutique*, September 15, 1894) emphasizes the treatment of *dry pleurisy* thus: In treating this form of the disease he suggests the employment of two methods,—first, revulsion; second, the general hygienic treatment of the patient. The object of revulsion is to prevent new congestions in the pleuræ. Some object to vesication, but use points of actual cautery. In the hygienic treatment of the patient it is aimed to make the parts less vulnerable to infectious processes. Forced alimentation is one of the most useful means, while sojourn in favorable climates with rest have given the best results.

Treatment of Hydrothorax.—In these cases where the liquid is of large amount especially, the repeated small tappings are of the greatest value. One case is quoted where twenty tappings were employed, and the patient discharged cured. If strict asepsis is practised there is positively no danger of infecting the chest and causing a pyothorax.

Treatment of Pyothorax.—The author believes that this operation belongs to the physician rather than to the surgeon. The bistoury is used and free drainage maintained, either by resection of a rib or a simple tube drainage. By making the incision crater-form and uniting the skin and pleura, a permanent opening may be formed. The chest is flushed with sterilized water and artificial serum.

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Treatment of Hematothorax.—In these cases it is best to resort to tapping with an aspirator, so that the operation may be cut short at any desirable time if the strength of the patient fails.

Pneumothorax.—If we have a simple pneumothorax, it is treated by injections of morphia and inhalations of oxygen to allay the dyspnea and pain. If these fail, tentative punctures of the chest may be tried, but usually they are inefficient. If the case is one of hydropneumothorax, however, it may, in case the urgency is not great, be left to nature, for frequently the liquid and air will both be absorbed. Potain's method, however, of withdrawal of the liquid and filling the chest with sterilized air may be tried with excellent results. A pyopneumothorax must be treated, however, by incision and washing of the chest with antiseptic fluid if the liquid is fetid.

Encysted effusions, if they are serous or gaseous, may be treated by Potain's method. If they are purulent, however, they must be treated by incision.

Ether and Opium Treatment of Pulmonary Tuberculosis.

Thomas (*Thèse de Paris*, 1894, quoted in *Bulletin Général de Thérapeutique*, September 15, 1894) reports fifteen cases of phthisis treated as follows: One or more centigrammes of sulphuric ether is administered by intramuscular injections in twenty-four hours. At the same time ten to twenty centigrammes of opium are administered usually in pill form. In ordinary cases it suffices to give an injection of one centigramme of ether in the morning, and two pills, each containing five centigrammes of *extrait thébaïque*, in the evening (extract of opium).

When the patient refuses the injections of ether, he is given the following:

℞ Extrait thébaïque (ext. opii)	·5	
Hoffmann's anodyne	20.	
Mucilage of acacia	120.	M.

Sig.—Four to eight tablespoonfuls in the twenty-four hours.

The author claims that this treatment is entirely free from danger and is not unpleasant. The effects of the treatment are noticed in the fourth to the tenth day by the suppression of the night-sweats and the increase of bodily strength and appetite. By the twelfth or twentieth day the expectoration decreases, and the dyspnea becomes less. The physical signs gradually improve, the breathing becomes more regular, and the signs of the tracheo-bronchitis disappear. The best effects of the treatment are seen in the cases where there is a tendency to rapid suppuration of the tuberculous foci. The treatment should be associated with the regular dietetic and hygienic course usually prescribed.

Cyclical Albuminuria.

Osswald (*Zeitschrift für klinische Medicin*, Vol. xxvi, Parts 1 and 2, 1894) after careful observation of a number of cases of this interesting affection, and a thorough search through the literature of the subject, comes to the following conclusions:

(1) Most of the patients come to the physician complaining of symptoms common in a true nephritis, or they may be met in examinations for insurance, when a diagnosis is not likely to be made.

(2) The symptoms as well as the anemia disappear with the disappearance of the albuminuria and recur with its reappearance.

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(3) In many of the cases there has been a previous acute nephritis following scarlet fever or diphtheria, and in some cases the acute nephritis is directly followed by cyclical albuminuria.

(4) The absence of organic elements, especially of casts, is not against a nephritis. Indeed, in some cases, especially in later observations, true casts have been found.

(5) Periodical albuminuria is often found in cases of true nephritis.

(6) Organic changes of the heart and other organs are not present.

He therefore believes that intermittent albuminuria—that is, an excretion of albumen of definite course without accompanying organic change—may, after years, entirely disappear, and cannot be viewed as a true nephritis in the ordinary sense.

He thinks they are often cases where there has been a previous nephritis and a few glomeruli are still diseased. These, under certain conditions of work, etc., cause albumen to appear in the urine.

Treatment of Ocular Diphtheria.

Valude (*Bulletin Général de Thérapeutique*, September 15, 1894) employs the following method in the treatment of diphtheria of the conjunctivæ:

(1) Hot irrigation of the eyelids with boric acid water or sterilized water containing extract of opium in the proportion of one to fifty.

(2) Antiseptic treatment of the conjunctiva by a solution of naphthol and an introduction twice daily of antiseptic ointment of iodoform of one to fifty.

(3) During the period of elimination of the false membrane the following is used: Oil of vaseline and terpinol, each ten parts; iodoform, four parts.

Apocynum in Cardiopathias.

Glinski (*Wratch*, 1894, pp. 6 and 7) has used apocynum cannabinum in heart-disease where there was mitral disease with failing compensation. He concludes that the drug possesses the same properties as digitalis without its disadvantages. It augments the diuresis, steadies the heart, and favors the secretions. He used a daily dose of fifteen drops of the fluid extract administered at five times.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

ASSISTED BY

G. G. DAVIS, M.D., M.R.C.S., AND ELLWOOD R. KIRBY, M.D.

The Treatment of Injuries of the Lower End of the Humerus.

Hutchinson (*British Medical Journal*, November 3, 1894) treats of the common fractures about the elbow-joint. The most frequent one is a more or less transverse fracture at or about the olecranon and coronoid fossæ. In subjects under 10 this will be a detachment of the lower epiphysis.

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Sometimes the chief feature of a fracture into the elbow-joint is the complete detachment of the articular surface of the radius, the special risk of which is the failure to secure bony union. Looking at the rapid supervention of swelling about the elbow that follows these injuries, it will probably be agreed that for the surgeon to effect a proper diagnosis and reduction he must administer an anesthetic as soon as possible after the accident.

In the treatment of these fractures the author advises against the use of all complicated splints and dressings, and favors a movable felt or tin splint.

As to the position of the forearm, the author recommends moderate pronation, so that the thumb is up. Experiments show that either extreme pronation or supination tends to laterally displace the lower fragment of the humerus. The very commonly used internal rectangular splint provides for this position, but it is not an ideal one, as there is certainly a tendency with its use to have more or less lateral displacement of the lower fragment (especially inward).

The author favors the position of flexion rather than extreme extension, because it is much easier to carry out, more comfortable for the patient, and has so far given the best results.

After certain fractures at the lower end of the humerus it may be laid down as a rule that bony union is not to be expected. These are mainly:

(1) Fracture or separation of the epiphysis of the internal epicondyle.

(2) Intra-articular fractures of the capitellum.

The first is by far the most frequent, and, in the author's experience, the little fragment is almost invariably drawn down towards the ulna and unites by fibrous tissue. Usually this displacement gives rise to but little trouble. Several cases have been reported where the displaced fragment pressed upon the ulnar nerve, causing ulnar paralysis. When the fragment is removed recovery is usually complete.

The capitellum when broken usually remains as a loose body in the joint, producing sometimes much trouble in movement. In neither of these fractures is any splint certain to be effectual. The only plan which promises bony union in good position is to fix the detached fragment with a needle or peg to the surface of the humerus from which it has been broken off.

In the majority of cases passive motion should not be begun until about the end of the third week. As regards compound fracture, the old rule of primary excision is not to be accepted. The removal of all loose fragments and good drainage will give much better results.

In old cases of fracture about the elbow, where persistent limitation of movement remains, the cause is probably to be sought in one of the following conditions:

(1) Pressure upon the ulnar nerve by projecting bone or callus. Time and massage usually overcome this difficulty.

(2) Thickening of the capsule in front and behind, with abnormal adhesion of muscles surrounding the joint. To be relieved by massage and passive motion.

(3) Intra-articular fibrous adhesions or alterations in the cartilaginous surface of the trochlea.

(4) Actual bony impediment to flexion.

The Prevention of the Recurrence of Volvulus.

Roux (*Centralblatt für Chirurgie*, 37, 1894), from the necessity of operating three times upon the same patient for volvulus, gives the following technical precautionary measures: It is known that as a cause of volvulus, the S-shaped volvulus,

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a shrinking of the mesocolon at its parietal attachment, with the approximation of both limbs of the gut, which then become filled with scybala, which can be moved about until at last torsion follows. This hypothesis has been proved by two cases upon which the author operated in 1887, as both patients, in consequence of the yet greater shrinking of the included mesocolon, have within the last year had a second attack. On both patients laparotomy was performed, the volvulus separated, and the lateral side of the mesocolon fixed to the abdominal wall.

In the first case only two catgut sutures were used for fixation. In the second case the loop of gut was fixed with a running suture between the mesocolon and the parietal peritoneum nearly to the linea alba.

That this perfect obliteration of the edges between the S and the abdominal wall is an absolute necessity is illustrated by a third attack, a few weeks before, in the first patient. The sutures had given way and the free head of the loop was twisted in the same manner as in the previous attacks. Both limbs of the loop were pressed closer together. In this case the continuous suture was used.

Statistics Relative to the Bassini Operation for Hernia.

Massopust (*Centralblatt für Chirurgie*, No. 39, 1894) has operated since 1888 upon 199 cases of inguinal hernia by the Bassini method, in cases in which, from inflammation or edema of the soft parts in strangulated hernia, or from other causes, the primary union was doubtful.

The cases were operated at two sittings. The closure of the canal and the skin union were postponed until the second sitting. From forty incarcerated hernias there were but two deaths and four others from gangrenous processes following the operation. The total mortality was 3 per cent.

Sepsis and pyemia occurred in four cases.

From the table supplied 130 operations after various periods following the operation were examined as to a return of the rupture. For a definite cure at least two years should have elapsed. Only fifty-five observations of this interval were possible, and from these in ten to twelve cases there was a return; this is about 20 per cent. In the thirty cases there was an interval of three years between the operation and the last examination. These cases must be regarded as absolute cures.

The Association of Calculus with Tumors of the Bladder.

Rochet (*Centralblatt für Chirurgie*, No. 40, 1894) believes that the association of calculus and tumors of the bladder occurring in the same patient is much more frequent than one usually believes. In about 99 per cent. of the cases the calculus is a secondary formation, and occurs mostly as an incrustation of the surface of the tumor with phosphatic deposits. In a small number of cases the occurrence of the tumor and the stone are independent of one another. Occasionally a torn piece of tumor forms the nucleus of a free calculus. In one case the author observed, in the midst of a fibrous tumor of the bladder, a calcareous body covered by mucous membrane entirely. This was, in the true sense of the word, a calculus, and the calcareous nucleus of the tumor, through perforation of its covering, might easily have become one. The chalky concretions on the surface of the tumor usually produce no special symptoms. Occasionally, however, they may produce the typical calculus symptoms by their number, size, and their separation from the tumor, in which case they mask the symptoms produced by the presence of the tumor. Small separated particles may be spontaneously discharged with the urine; larger

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ones may lodge in the urinary passage. They produce symptoms partly by obstruction and partly by injuring the mucous membrane through their sharp edges and spicules.

The Treatment of Diffuse Purulent Peritonitis.

——— (*Deutsche medicinische Wochenschrift*, September, 1894) reports two cases in which recovery ensued after incision and drainage.

(1) A patient, aged 54, was admitted with strangulated hernia. An empty hernial sac was found on the right side, and a piece of omentum and intestine on the left. After the intestine slipped back into the omentum some discolored and foul-smelling fluid escaped.

The condition of the patient did not improve, and six days later the abdomen was opened along the margin of the right rectus muscle, and 300 cubic centimetres of stinking pus escaped. Patient recovered.

In the Berlin Charité twenty-five such cases have occurred, and of these five recovered. The hopeless nature of these cases accounts for the small number of recoveries. In two the peritonitis was due to perforation in typhoid fever, in nine to long-continued obstruction, in four to perforating intestinal ulcer, in one to perforating ulcer, and in nine no cause was known.

Paralysis Resulting from the Esmarch Bandage.

Frey (*Centralblatt für Chirurgie*, No. 38, 1894), on account of three similar cases in Wolfler's clinic of paralysis of the upper extremity after the application of the Esmarch tube, concludes that the paralysis results from a direct mechanical injury to the nerve-trunks by pressure of the tube. He advises against the too violent use of the tube.

These collected cases recall the words of Esmarch in a lecture upon the saving of blood in operations and injuries, in which he remarked that in the numerous cases reported paralysis did not result from the method but from an improper use of the tube. In concluding his article, the author refers to the so-called narcosis paralysis of the upper extremity resulting from an extreme abduction or elevation of the arm with a pinching of the brachial plexus.

THERAPEUTICS.

UNDER THE CHARGE OF

HORATIO C. WOOD, M.D., LL.D., AND ARTHUR A. STEVENS, M.D.

Antitoxin in Diphtheria in Berlin, in New York, and in the Municipal Hospital of Philadelphia.

Fischer (*American Journal of the Medical Sciences*, January, 1895), in a timely article upon the above subject, sums up the results obtained by Professor Baginsky in Berlin, and by himself, with the antitoxin treatment of diphtheria. In Baginsky's 128 cases the mortality was 13.2 per cent. Under the old treatment the mortality in 1081 cases was 38.9 per cent.

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Dr. Fischer had 34 cases,—30 malignant and 4 mild,—32 of which recovered; a mortality of 5.8 per cent. The diagnosis in all cases was confirmed by a bacteriological culture made by removing a small particle of membrane from a portion which appeared oldest, and stroking over agar-agar or blood-serum, and placing in the thermostat. Of the 34 cases injected 29 were malignant cases, in which a grave prognosis was given by the attending physician or by the author himself in consultation; 4 were mild cases in the commencement of the disease, and one was moribund. By *malignancy* the author means cases that had either distinct evidence of sepsis, showing low temperatures or very high temperatures, and where marked somnolence was evident, where cervical glands were considerably enlarged, and where, at times, the skin showed, in addition to cold, clammy perspiration, a decided icteric appearance; where there was also a foul mouth, a distinct cadaveric breath, and where only a grave prognosis was given. Such cases not only showed pharynx, tonsils, and uvula involved, but also symptoms of stenosis of the larynx and occlusion of the nares.

The main point was to apply the antitoxin as early as possible, and counteract the septic matter absorbed, and thereby avoid complications, besides using the local treatment of swabbing the throat with a 1 : 2000 bichloride of mercury solution, using a fresh swab for each application, and burning the same immediately after using it.

The author describes the technique as follows: "Having properly sterilized the syringe by boiling, and using 0.5 per cent. tricresol, I commence by injecting ten cubic centimetres in mild cases, and twenty cubic centimetres in malignant cases, by pinching a fold of skin in the intrascapular region and allowing the serum to be slowly injected. I believe it proper, however, to have a syringe of suitable size, and inject the required amount rather than inject in several places. The calibre of the latter must necessarily be quite large, owing to the thickness of the serum, which is, at times, rather mucilaginous. It is proper to note all differences and effects on the false membrane and the swelling of the glands, the behavior of the temperature, the condition of the urine, the effect on the heart, and, especially, the pulse. There should be no hesitation in injecting on the second day, and, if no effect is seen, repeating the injection on the third day, as there is absolutely no risk from the injection. . . . The temperature does not fall by crisis, but by lysis, with antitoxin treatment. Massage of the serum after the injection should not be practised, according to Heubner, Aronson, Baginsky, and others."

In conclusion the author urges the importance of rigid disinfection of all discharges, including feces, the local use of antiseptics, an enforced recumbent posture, and the cautious administration of stimulants.

Direct Introduction of Uric Acid into the Body; Its Bearing on the Prevention and Treatment of Disease.

Haig (*British Medical Journal*, December 8, 1894) has made some further investigations on the above subject. He states that in judging of the effects of uric acid its solubility in the blood must be taken into account, and that in neglecting to do this other experimenters have fallen into serious error. When two or three grains of uric acid are taken with food they slowly pass into the blood with the other products of digestion, but unless the alkalinity of the blood is very high, they do not remain in the blood more than a moment or two, but are caught up and temporarily deposited in the liver, spleen, and other organs. Further,

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uric acid, by converting the normal phosphates in the blood, which are good solvents, into acid phosphates, which are poor solvents, interferes with its own solubility. This explains why the administration of uric acid does not increase the excretion of uric acid, but often actually lessens it. When, however, alkalies are previously given, the blood holds the urates in solution, the excretion of uric acid is increased, and the characteristic symptoms of an excess of uric acid in the blood manifest themselves. The injection of uric acid into the blood is, therefore, often followed by negative results, because it remains in the blood only a few seconds.

It must be borne in mind also that uric acid may be present in the blood in combination with salicylic acid, or the normal phosphates in large quantity, as shown by a large excretion in the urine, without producing distressing symptoms. So far as the writer knows, it is only the combination of uric acid with alkalies that produces marked symptoms,—headache, mental depression, and high-tension pulse.

The solubility of uric acid in the blood is favored by everything that increases the alkalinity of the blood, and hindered by everything that decreases the alkalinity of the blood, and uric acid accumulates because it is insoluble, while the soluble urea is practically excreted just as it is formed.

The author believes that at the present day much uric acid is often unnecessarily and thoughtlessly introduced into the body, while very slight modifications of diet rules might serve to exclude several grains a day, and this, taken over months and years, might just make the difference between health and disease. If a man introduces three grains of uric acid a day, he will introduce 1000 grains in a year, and about 20,000 grains, or about three pounds, in twenty years. But uric acid thus introduced into the body may not only stay there, but at the time of its introduction it absolutely interferes with excretion of that which has been previously introduced or formed in the body.

The first action of uric acid is that of a stimulant, and this is due to the fact that it clears the blood of uric acid and diminishes the excretion in the urine. This is the probable explanation of the stimulant effect of soup, beef-tea, and meat extracts. Later on, when the uric acid comes to be present in excess in the blood and urine, general depression of mind and metabolism takes the place of previous stimulation.

If a man had by care in diet during twenty years introduced only a few hundred grains of uric acid instead of three pounds of it, he would not only have had less uric acid from which to accumulate a store, but he would have been able to excrete more freely that uric acid which he himself formed. The daily introduction of uric acid may be materially diminished without diminishing the income of substances on which nutrition depends. There is almost no nourishment in soup, beef-tea, meat extracts, and vegetable alkaloids, and the nutrition of the body will not suffer if they be entirely omitted.

The craving for fruit acids in summer is doubtless due to a loss of acids in perspiration, and it is far better to indulge it to a moderate extent than to supply the want from effete nitrogen in the form of uric acid and its congeners. Caffeine may cure uric-acid headache, so would a few grains of uric acid itself; only they cure it by increasing the store of uric acid in the body, and this, if persisted in, will bring disaster at no distant date.

It follows from this that whatever other diet treatment may be necessary for the prevention or cure of uric acid disease, it is of the utmost importance never to introduce into the body a single grain of uric acid that can be left outside it; for

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that grain of uric acid, if introduced, may not only remain and help to form a store in the body, but it may also prevent the excretion of some uric acid which is already in the body.

Lactophenin.

Straus (*Therapeutische Monatshefte*, September, 1894) reports his experiments with lactophenin as an antipyretic.

In seven cases of typhoid fever in which he administered the drug, while the sedative effects were not so constantly observed as in Von Jaksch's cases, it never gave rise to unpleasant symptoms. The dose was seven to fifteen grains, and never exceeded forty-five grains a day. The antipyretic action of the drug was pronounced. The writer regards lactophenin as a good substitute for perfect hydrotherapy.

In four out of five cases of facial erysipelas it lowered the temperature; in the remaining case other antipyretics also failed.

In two cases of diphtheria (one septic) the temperature fell nearly 2° C. within five hours.

In three cases of pneumonia its antipyretic action was noticeable.

In one of two cases of scarlet fever it failed to act.

In five cases of phthisis it lowered the temperature and caused profuse diaphoresis, but produced no unpleasant effects.

In one or two instances its use was accompanied with a diffuse rash.

Trichloracetic Acid in Epistaxis.

Kossolino (*Vratch*, No. 82, 1894) highly recommends a 3-per-cent. solution of trichloracetic acid in persistent epistaxis as a substitute for the chloride of iron. It has a great advantage over the iron salt in being highly antiseptic. It may be applied on cotton wrapped around a probe. The intense burning sensation which it causes may be overcome by the addition of a 20-per-cent. cocaine solution.

Cactus Grandiflorus in Heart-Disease.

A. V. Mikhailoff (*Kharkov Jürnal Meditziny i Hīghieny*, No. 2, 1894) relates two cases of Graves's disease, three of cardiac organic affections, and two of chronic parenchymatous nephritis, in which he used fluid extract and tincture of cactus. The former was given in doses of five, and the latter in doses of from ten to forty-five, drops thrice daily. He found that (1) the administration rapidly induced a rise of arterial tension, which, however, was but very slight, and disappeared shortly after discontinuing the drug; (2) in cases of Graves's disease the secretion of urine increased, while in patients with renal disease it remained unaltered; (3) cardiac palpitation and dyspnea quickly subsided, this effect being especially pronounced in exophthalmic goitre; (4) to secure a marked and permanent improvement a prolonged administration of the remedy in gradually increasing doses seems to be necessary.—*British Medical Journal.*

Bromide of Ethyl as an Anesthetic.

Cumston (*Boston Medical and Surgical Journal*, December 20, 1894) has employed bromide of ethyl as an anesthetic in some 200 cases. He highly recommends it for short, minor operations, and believes it to be perfectly safe when

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cautiously administered. When fit for administration the liquid should have the following properties:

(1) It must be extremely volatile; when poured on the hand it should evaporate completely and rapidly without leaving any deposit.

(2) It must be colorless; if it is yellowish, this signifies that it is decomposed and that a little bromine is set free, which would irritate the respiratory system.

(3) Its odor must be sweet and ethereal.

The dose varies with the age: 12 to 15 grammes for children from 2 to 10 years; 15 to 20 grammes for children over 12 years and adults. The patient should be instructed emphatically to take nothing to eat, not even a glass of milk, on the morning of the operation. The mask should cover the mouth and nose perfectly, no air being allowed to enter. The entire dose should be given at once. Twenty to thirty seconds is sufficient to obtain sleep. Insensibility lasts from two to three minutes. Patients are perfectly well in a few minutes after the narcosis.

The author formulates the following rules as to the administration of bromide of ethyl:

(1) Bromide of ethyl should be carefully distinguished from the bromide of ethylene.

(2) Only employ a pure, and, if possible, a freshly-prepared bromide of ethyl.

(3) Only give the drug *en masse*, as some patients have died by giving small and continued doses.

(4) Do not prolong the administration over *one minute*.

(5) Once the mask is removed and the operation begun, do not apply it again.

(6) The contra-indications are dangerous lesions of the heart and lungs, as well as of the kidneys.

Chloralose-Poisoning.

Touvenaint (*Revue de Thérapeutique Médico-Chirurgie*, No. 11, 1894) reports two cases in which toxic symptoms followed the administration of very moderate doses of chloralose. The first patient, a diabetic, received three and one-half grains of chloralose, which produced sleep lasting two hours. A second dose of the same size was then administered, and a few hours later he awoke suffering from intense malaise, deafness, tremors, incoherent speech, nausea, and dysphagia. The symptoms grew worse, and were soon followed by marked dilatation of the pupils, a slow, feeble pulse, and incontinence of urine and feces. The case was treated successfully by the use of enemata of black coffee, ether, sinapisms, and frictions. In the second case, a patient with a uterine fibroma, two doses of three and one-half grains each caused similar symptoms, with the addition of vomiting.

The Treatment of Rheumatism.

Moritz (*Centralblatt für de Gesammte Therapie*, October, 1894) claims to have secured excellent results from the following method of treatment. The patient is placed in a hot bath (38°–41° C.) for twenty minutes. He is then wrapped in a sheet and covered with several warm blankets. Sodium salicylate (fifteen grains) is now administered and followed by a copious draught of hot lemonade. Profuse sweating is soon induced, and is allowed to continue for an hour, when the body, member by member, is subjected to thorough rubbing with a cloth wrung out of cold water. The patient is then covered with dry clothes and placed in a warm bed. In the evening another dose of sodium salicylate is given, and followed by hot lemonade. The author states that under this treatment a cure is frequently effected in from three to five days.

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Trional-Poisoning.

Hecker (*Centralblatt für Nervenheilkunde und Psychiatrie*, Band IV, 401, 1894) reports the following case: A woman, aged 50 years, a sufferer from mental depression for ten years, had taken forty-five grains of trional at bedtime with good results for a period of ten days. Subsequently, however, the drug induced coryza, slight fever, vertigo, weakness, and profound malaise. Subsequently symptoms resembling paretic dementia developed. The discontinuance of the hypnotic was followed by a complete restoration to her former condition.

OBSTETRICS.

UNDER THE CHARGE OF

BARTON COOKE HIRST, M.D.,

ASSISTED BY

RICHARD C. NORRIS, M.D., AND FRANK W. TALLEY, M.D.

Etiology of Puerperal Sepsis.

Dr. J. Whitridge Williams, of Baltimore, in discussing puerperal infection before the Obstetrical Society of Philadelphia (*American Gynecological and Obstetrical Journal*, January, 1895), claimed that puerperal sepsis is due to a number of micro-organisms, the most frequent causal organism being the streptococcus pyogenes. Cases infected with staphylococcus aureus are comparatively rare and usually of moderate severity. He knows of no fatal case following infection with the gonococcus.

In the management of labor cases he believes in subjective antisepsis. He condemns vaginal douches in general practice. In the hospital practice he believes that the cases should be differentiated from a bacteriological stand-point, and those cases having an abnormal vaginal secretion should be douched.

In regard to the treatment of puerperal fever, if mild, he advises the cleaning out of the uterus and the uterine douche, but is indifferent if bichloride of mercury solution, carbolic acid solution, or simple boiled water be used. The fluid acts mechanically, and enough of the antiseptic to do good cannot be used unless continuous irrigation be resorted to.

In conclusion, he believes in the possibility of auto-infection, and in rigid subjective antisepsis in the management of labor. The vaginal douche is condemned in private practice, but is to be used in those hospital cases where there is diseased vaginal secretion.

Pregnancy in a Woman Presenting Nymph-Infibulation.

Collier (*American Medico-Surgical Bulletin*, December 15, 1894) reported the following case before the New York Academy of Medicine: Patient, Mrs. H. H., sought his advice in the summer of 1894, suffering from uterine disease and being five weeks pregnant. She was 28 years old, and a German by birth. She had been married ten years, and the mother of several children. He examined her and observed two holes in the nymphæ. When he asked her concerning these, she

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reluctantly told him she had been compelled by her husband to wear a lock. Her mother, prior to their marriage, sent her over here to his care (he having left Germany some months before). On her arrival he perforated the labia minora, causing her to be very ill for several weeks; after sufficiently recovering, he put on a padlock. For many years he practised this habit of locking her up after intercourse, and no one but himself had ever before inquired about the openings.

Tumors of the Placenta.

Dr. Edward Alin (*Warfoinge's Festschrift*, p. 217, 1894) observed an interesting case of this nature in a III-para, 29 years old, the placenta weighing 640 grammes (21 ounces). In the marginal portion, four centimetres thick, there was a solid tumor as large as a hen's egg, and another the size of a walnut, five centimetres distant, in the centre of the placenta. Both tumors were made up of numerous smaller ones, varying in size from the head of a pin to a hazel-nut. The tumors could be easily distinguished from the rest of the placental tissue by their compact appearance. There were no other tumors, infarcts, or hemorrhage, or any condition which would indicate an impediment in circulation, and no inflammatory areas or signs of degeneration. The tumors were found to consist of capillary vessels, surrounded by scanty connective tissue with few cells. There was no trace of a sarcomatous structure. The endothelium of the vessels consisted of a single layer, with well-defined cells, coloring easily. The author regarded the tumors as due to hypertrophy of the chorionic villi with abundant vascularization.

Pregnancy in a Rudimentary Uterus.

Dr. Leonard Remfrey (*Transactions of the London Obstetrical Society*, Meeting of October 4, 1894) presented a specimen removed from a patient at St. George's Hospital, in a case of pregnancy in a rudimentary uterus. The principal interest of the case lay in the diagnosis during life and at the time of operation. The uterus was slightly tilted over to the right, and attached to it was a rounded hard mass, feeling exactly like a fibroid. The tube and a round ligament were both on the same side as the tumor,—an important fact, because, if the round ligament were on the side opposite to the tube, the case would be one of extra-uterine gestation; whereas, when on the same side, it would be part of a double uterus. The patient was 30 years old, without any history pointing to pregnancy, and was therefore treated for fibroid for one year. The tumor diminished somewhat in size; but as she continued unable to work, the author proceeded to operation, when he found that he had been entirely mistaken in the diagnosis. On passing the hand down the right side of the pelvis he encountered what appeared to be a normal uterus, from which came off the right tube and right broad ligament. To it, joined only by a narrow pedicle, was the mass above alluded to, which he removed without difficulty. The woman had no rise of temperature, and the stitches were removed on the seventh day. On the eighth day, in consequence of a violent fit of coughing, the intestine escaped through the wound cicatrix, and by the time attention was called to her condition the coil of intestine had become of a dark red, and the patient was very much collapsed.

He returned the intestine without difficulty, and washed out the peritoneal cavity, but she sank and died next day. Post-mortem examination showed the stump to be perfectly healthy. The specimen contained a macerated skeleton.

The cavity appeared to have no connection with the uterus.

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GYNECOLOGY.

UNDER THE CHARGE OF

CHARLES BINGHAM PENROSE, M.D.,

ASSISTED BY

WILLIAM A. CAREY, M.D., AND H. D. BEYEA, M.D.

A Contribution to the Diagnosis and Therapy of Carcinoma of the Fundus Uteri.

Calderini (*Berliner klinische Wochenschrift*, No. 15, 1894), in a series of 150 cases of carcinoma of the uterus, was able to diagnose eight (where the cervix was perfectly normal) as new growths of the fundus uteri. Upon six of the cases hysterectomy was performed, one was operated upon elsewhere, and the other refused operation. One case died as a result of the operation, and another from a return of the disease with metastasis. The remaining four are still living and healthy. The women who refused operation died with metastasis to the peritoneum. The histories of three other cases are: the first was diagnosed through microscopical examination as non-malignant adenomatous disease of the mucosa, and the second and third as rapidly-developing sarcoma. All three cases gave metastasis to other organs. The last cases show the result of delayed diagnosis. These cases prove how very important the microscopical examination of curetted tissue from the uterus is, and that one should not be satisfied with the diagnosis of fungoid hemorrhagic endometritis. If the diagnosis of a malignant new growth is definitely made, provided the uterus is still movable, a complete hysterectomy is indicated. In doubtful cases Calderini advises that, after a short time, the uterus be curetted again and the removed tissue carefully examined microscopically. In cases of simple adenoma, where the epithelial cells are atypical or there is, in places, a double row of epithelial cells and they show active karyokinesis, the radical operation is indicated.

The Operation of Vaginal Hysterectomy after Ventro-Fixation.

Jacobs (*Policlinique*, No. 24, 1893) has found it necessary in two cases to perform vaginal hysterectomy after ventro-fixation. In the first case he had previously performed amputation of the cervix, ventro-fixation, and nephropaxy. The operation was made difficult because of a pedicle of adhesion two and a half inches in length between the uterus and abdominal wall. The pedicle was allowed to retract. Eight days after operation the patient had distinct symptoms of intestinal obstruction, and he was compelled to perform celiotomy. The retracted pedicle was found adherent to the intestine, evidently causing the symptoms, and was excised. The patient died the following day. The operation was for diseased adnexa. In the second case the operation was performed five months after ventro-fixation. The uterus could be felt in normal position, attached to the abdominal wall. The indication for operation was bilateral pyosalpinx. Profiting by the results of the previous case, he first began the vaginal hysterectomy, then opened the abdomen and separated the band of adhesion, after which he completed the vaginal operation. The patient recovered.

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Sublimate-Poisoning in Hysterectomy.

Hermes (*Centralblatt für Gynäkologie*, No. 23, 1894) reports an instance of sublimate-poisoning occurring during vaginal hysterectomy. The patient was a woman, 45 years of age, previously healthy, with carcinoma of the cervix. Two days preceding the operation the vagina was cleaned, disinfected with lysol, and packed with iodoform gauze. During the operation, until the time of opening, Douglas's cul-de-sac sponges were used, which had been expressed, from a 1 : 4000 solution of the bichloride of mercury. Boric acid solution was employed after opening the peritoneum. After two days without symptoms, the patient began to have diarrhea, the pulse became 160, and the temperature 104° F. The next day the stools became more profuse, frequent, and were bloody, the pulse more rapid (170), the temperature reached 105.6° F., and the patient died in collapse ninety-six hours after operation. On making a post-mortem a portion of sponge the size of a walnut was found at the site of operation. The post-mortem, except that no deposit of phosphate of calcium was found in the kidneys, revealed a typical picture of sublimate-poisoning, acute parenchymatous hepatitis, and nephritis, with diphtheritic ulceration in the large intestine. That a sufficient amount of the sublimate to produce death was introduced through so small a wound in such a short time seems very doubtful. The portion of sponge found in the abdominal cavity had been kept in a 1 : 1000 solution of sublimate and at the time of operation was expressed from boric acid solution. Hermes believes that this last was the cause of the poisoning. In conclusion he makes the following statement: First, that the use of sublimate solution in vagino-abdominal operations should be discontinued, particularly where douching is employed, and that sterilized normal salt solution should be substituted. Second, that the employment of sponges involved a double danger, in that portions of a sponge are very easily torn off and retained in the abdominal cavity which may produce either septic peritonitis or sublimate-poisoning. He therefore advised the use of sterilized gauze compresses.

The Causation and Pathology of Pelvic Inflammation.

L. S. McMurtry (*American Journal of Obstetrics*, November, 1894) says, The uterus is almost invariably involved in the process, its cavity being, as a rule, the point of departure and route of access of the inflammation. The inflammatory process, beginning in the uterine cavity, extends along contiguous mucous surfaces through the Fallopian tubes to the peritoneum, often destroying tissues and invading parenchymatous structures in its advanced course. The salpingitis, peritonitis, ovaritis, exudation, adhesions, pyosalpinx, hematosalpinx, hydrosalpinx, ovarian abscess, and lesions of the bowel are but resultant factors in the disease, corresponding to the intensity and stage of inflammation and structures involved.

The disease is one and the same, of which these are the varied expressions, and must be considered as a single disease having numerous stages and sequelæ and many causes.

Pelvic inflammation originates, practically without exception, from septic infection.

Septic infection may be specific or traumatic, including among traumatic causes the wounds of childbearing and abortion. Puerperal infection exceeds all other etiological factors in this disease. The open surface left by separation of the placenta is particularly liable to infection, as is also the intra-uterine surface after abortion. The enlarged lymphatics and hypertrophied blood-vessels, torn across

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and gaping, the process of degeneration following the complete term of pregnancy, almost pathological, offer a most receptive surface for absorbing, developing, and diffusing the slightest contamination by septic matter. An amount of septic matter will suffice to infect a woman under these conditions which would be resisted and overcome by the normal non-gravid uterus.

Moreover, the retention of portions of placenta partially detached and deprived of circulation renders infection even more easily accomplished.

A combination of puerperal infection and gonorrheal infection may coexist in the same individual, and give rise to what is termed mixed infection. This is by no means a rare occurrence.

A different class of traumatic infections is that of certain surgical operations and manipulations upon the uterus, such as arise from the use of sponge-tents, dilators, operations on cervix and within the uterine cavity. The traumatism by which tissues rich in lymphatics are exposed to infection by foul discharges and dirty instruments is often the initial step in severe grades of pelvic inflammation. It is not the traumatism *per se* which begets the inflammatory process; it is the admission of septic material. The inflammation is prevented by a healthy, clean mucous membrane and a proper aseptic condition of instruments.

Among other causes of pelvic inflammation may be mentioned tubercular salpingitis; the eruptive fevers, especially scarlatina and variola, and a sudden suppression of menstruation.

The irritation from other morbid conditions, such as that which arises from rupture of cystic growths, the pressure of solid tumors and obstruction of the tubes with retention and extension of secretions, with hypertrophy of epithelial and interstitial elements are factors in the production of a localized peritonitis. Imperfect development and malformation of the uterus and appendages may sustain a causal relation to pelvic inflammation. In studying the lesions of pelvic inflammation the tubes are of greatest importance, since they are the route of access and focus of the inflammatory process. The various classifications of the disease are but anatomical limitations of a single pathological process, determined by the character of infection, and nature's ability to resist its access by confining its area. At the outset there is congestion followed by effusion. The effusion is from the mucous membrane and into the underlying connective tissue. The rapidity and extent of this process depend upon the virulence of the attack and the condition of the parts. The tubes become filled with serum, which may drain into the uterus or discharge through the fimbriated ends into the peritoneum, or it may be retained by closure of these openings. The exudation into the tissues varies, making the tube-walls more or less thickened by infiltration with cells, in some instances penetrating the walls, and directly invading the peritoneum. The tube becomes adherent to the uterus and ovary, the broad ligament is matted down, and the fimbriæ covered over. Should nature's efforts avail to confine the effusion by sealing the fimbriated extremity of the tube, a hydrosalpinx will be formed. If the inflammation is accompanied with hemorrhage, a hematosalpinx results. Resolution may take place more or less perfectly later on. If the process ends in suppuration there is a pyosalpinx. If the contents leak through the fimbriated opening into the peritoneum, whether pus has formed or not, active peritonitis results. This is a conservative process, nature endeavoring to shut off the general peritoneal cavity by adhesion, and thus limit the inflamed area. Later on this exudate may be absorbed, or undergo organization or suppuration. When this process is virulent, tissues are infiltrated and destroyed by the intensity of the process, and break down by slight manipulation.

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MISCELLANEOUS.

A SURGICAL CLINIC IN THE EARLY DAYS OF THE PENNSYLVANIA HOSPITAL, PHILADELPHIA.

By CHARLES B. WILLIAMS, A.B., M.D., Philadelphia, Ex-Resident Physician, Pennsylvania Hospital; Dispensary Surgeon, Methodist Episcopal Hospital, Philadelphia.

ON Wednesday, September 30, a trifle more than seventy-five years ago, at about eleven o'clock in the morning, the class, numbering eighty students of medicine from different parts of the Union, had nearly all assembled in the old circular room on the third floor of the hospital at Eighth and Spruce Streets, and were anxiously awaiting the appearance of the venerable professor of surgery, Dr. P.

A number of the students were busily engaged in looking over their notes of the last lecture, but the majority were occupied in animated discussions over the topics of the day, or some pleasing adventure of the night before. Let us move towards the door-way where stands an interesting group of five young fellows, who appear to be merrier than the rest of their companions, judging from the hearty peals of laughter that now and then follow some sally of wit. One of them, a tall handsome youth, with clear-cut features and dark eyes that are brimful of humor, is engaged in reading the morning paper. Suddenly, giving his nearest companion a nudge at the shoulder, and raising his voice, he exclaims, "Oh, gentlemen, here is the notice of a new book in this morning's *Advertiser*.[1] It is the first on a long list of books advertised by William Prichett, the bookseller, on High Street[2] above Second. The title of it is, 'How to Obtain Success in the Practice of Physic,' by William Hall, M.R.C.P., etc. I think that it would be advisable for us to go down and have a look at the work after the lecture."

"Well, gentlemen," exclaimed one of the party, "you might save yourself a long walk if you would but pause and think a moment. I am under the impression that the one and only way to obtain entire skill and success in the practice of physic is to work hard, for you

[1] Poulson's American Daily Advertiser, 106 Chestnut Street, and the United States Gazette, 66 Dock Street, were two of the most prominent papers of Philadelphia at this period.

[2] High Street was originally so called because of its having been the highest elevation from the river of all the other streets,—changed to Market Street by the popular voice, because of the markets in it. *Vide* Watson's Annals of Philadelphia, Vol. II. An old High Street sign may still be seen on a warehouse at the northwest corner of Market and Water Streets.—C. B. W.

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know, *nulla scientia sine labore.* And as long as we have not yet obtained our degrees in course, I should recommend that we meet at the Coffee House after the lecture. I have just learned that the widow Roberts has a new supply of Woodville's yellows;[1] we can then question each other upon the principal topics of to-day's lecture. And that will be profitable work, surely."

Another youth, with classic features, that reminded one of the busts of Antinous, who, until now, had been busily engaged in reading a periodical, suddenly exclaimed, "My dear friends, here are a few lines in the *Medical Examiner* that will interest some of us: 'Dr. Pertier, a German physician, states that he has found the spirit of hartshorn (in the dose of a small teaspoonful in a glass of water) to counteract the inebriating effects of fermented liquors and spirits.' I think that had our friend across the way, George Wilkinson, taken such a draught the other evening, he would not have caused his friends such anxiety while they were assisting him to his home. William Johnson told me that they had the greatest difficulty in preventing him from removing the door-plates of some of our prominent physicians. He looks rather remorseful this morning after last night's experience."

Finally, another of the party exclaimed, "Have you heard of the treatment for a cold that Dr. P. has lately employed in his practice? It is his favorite method of treating all simple cases of 'taking cold.' A friend of mine undertook to ride from Whitemarsh to Philadelphia, a distance of fifteen miles, during a heavy snow-storm. When he reached my house in the evening, he was taken with chills, a fever, and followed by a severe sore throat. I began to fear that my friend had symptoms of an approaching *cynanche trachealis*, so I called in Dr. P. Our venerable professor ordered the patient to take thirty drops of laudanum[2] and toast his feet at the fireplace. In the mean time he was to drink flaxseed tea and barley-water *ad libitum.* He retired early, and this morning, saving a slight huskiness in his throat, he feels almost able to go about again. But stop, gentlemen, the clock wants a few minutes to eleven; let us take our places, for the venerable professor will soon be here."

"Venerable, did you say?" exclaimed our young acquaintance, folding his newspaper; "he is not merely venerable, but *doctor nobilis, præclarus, et venerabilissimus.*"

"Very true," exclaimed his companions, as they took their seats facing the amphitheatre.

[1] Woodville's yellows,—a particular brand of Havana cigars at that period.

[2] The laudanum of those days was considerably weaker in its strength of contained opium as compared to the laudanum of our own times,—otherwise, our young friend would probably not have arisen so early the next morning.

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Presently the professor of surgery, followed by the two apprentices[1] of the hospital, Messrs. Benjamin H. Co—es and Warwick P. Mi—r, entered the amphitheatre.

Dr. P. was of a medium height; his countenance was noble and striking; his mouth was beautifully formed, and his lips being somewhat thin denoted a firmness and decision in his character. His eyes were dark, and though keen and penetrating, they, at times, seemed to mellow into a pleasing tenderness that lighted up his whole visage. Such a noble exterior added to a kindly sympathy for the miseries and woes of others could not fail to win the love and respect of his patients.

Advancing to the centre of the room and bowing, Dr. P. began his lecture as follows:

"Gentlemen: The first case that I shall present to you this morning is that of James Hayes, of Dauphin County, Pa., from whose face I removed a large tumor about one week ago. For the benefit of those gentlemen who were not present at the operation, I shall give a brief history of the case. The patient was admitted to the house about ten days ago with a large wen covering one-half of the lower jaw and extending from the lobe of the left ear nearly to the eye and the angle of the mouth on the same side. Upon examination the tumor was found to be movable, and it did not appear to have any immediate attachment to the bones of the head or face. The wen had been upward of twenty years progressing in its growth, and when extracted it was measured and weighed by one of the apprentices of the house.

"Its dimensions were as follows:

"Projection from the patient's cheek was seven and a half inches. The circumference around the base of the tumor was twenty-three inches. The circumference in its largest extent was twenty-five and a half inches. The circumference in its least part was nineteen and a half inches. Its weight equalled seven pounds. During the course of the operation the parotid duct was divided, and the patient lost from ten to twelve ounces of blood. The operation was a severe one, and the patient bore it with the greatest fortitude. I shall now proceed to remove the dressings for the first time since the operation.

"I find that there is no discharge of saliva from the wounded duct, and that the greater part of the divided integuments have re-united by first intention. Gentlemen, at this stage of the case we could not wish for a better result.

[1] The "house physicians" of the Pennsylvania Hospital, beginning with Jacob Ehrenzeller, in 1773, were designated as apprentices, and were regularly indentured to the managers of the institution to serve for five years. Most of these apprentices received their degree in medicine before finishing their term of service. They usually entered the institution at about the age of 17. Beginning with the year 1824, the managers of the hospital resolved to elect only graduates of medicine to serve as resident physicians.

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"If the process of healing continues to progress at this rate, the patient will very shortly be able to return to his home.

"The next case that is now being brought from the wards will be one for amputation. The history of the case is as follows: Yesterday, J. Z., a porter, aged 31, who has been in the habit of drinking large quantities of ardent spirits, fell down the cellar of a warehouse at Second and Dock Streets. Shortly after the accident he was brought to the house, and upon examination it was found that the tibia was dislocated from its connection with the astragalus, and forced through the integuments, which were much lacerated. The internal malleolus was broken off and could be distinctly felt under the tendo Achillis; the lower end of the fibula was fractured, and the astragalus was broken into four pieces. After considerable force, attended with great pain, reduction was effected, and the limb was dressed in the common way. In the evening I called a consultation of the staff, and after an attentive examination they unanimously proposed amputating the leg. The consent of the patient has been obtained, and I shall now proceed with the operation.

"The point that I shall select for amputation will be about midway between the ankle and the knee. I have fixed the tourniquet a little above the knee so as to compress the artery in the ham. One of the apprentices will grasp the limb with both hands above the knee while the other will hold the ankle.

"As you perceive, gentlemen, I am going carefully into all of the little points of this amputation, for in the near future a few of you may be called upon to perform a similar operation solely upon your own resources, and with no one *close* by to direct you. Standing upon the inside of the leg I make a circular incision through the integuments and the muscles down to the bone. And by the aid of a catline I shall now proceed to divide the interosseous parts. A scalpel would answer the same purpose should you not have a catline close at hand.

"The retractors having been applied, one of the apprentices will now draw up the soft parts, while I proceed to saw through the tibia and fibula.

"Before taking up the arteries I wish to state a few words about ligatures. For several years past I have noticed that after the performance of operations the wounds were prevented from healing, and the patient was subjected to the greatest pain and distress in consequence of ligatures made from silk or flax, remaining fixed in the wound for the period sometimes of many weeks or even months. The wound was therefore prevented from healing; and the operation of pulling at the ligature from day to day subjected the patient to a degree of pain and discomfort that far exceeded that of the original

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operation. I have repeatedly recalled to mind how completely leather straps spread with adhesive plaster, and applied over wounds in order to keep their edges in contact, were dissolved by the fluids discharged from the wound. It therefore appeared to me that ligatures might be made of leather, or some other animal substance, with which the sides of a blood-vessel could be compressed for a sufficient time to prevent hemorrhage; that these ligatures would be dissolved after a few days, and would be evacuated with the discharge from the cavity of the wound. I have had therefore some ligatures carefully prepared from sheep's gut by one of the apprentices, which I shall use this morning for the first time during my service in this hospital. And now by aid of the pliers I shall proceed to take up the ends of the divided arteries and secure them with the animal ligatures. Altogether, I have tied eight bleeding vessels. I shall now draw the soft parts over the bones, and having seen that the edges of the skin are exactly applied to each other, secure them with a few strips of adhesive plaster.

"As a dressing I shall use lint smeared with simple cerate. Over this a compress of fine tow is placed and retained by a broad piece of old linen passing well up to the knee. And, finally, I secure the whole with several turns of the roller bandage. The tourniquet may now gradually be removed. The patient will be placed in bed with his limb elevated upon a soft pillow. And in order to procure him some ease through the rest of the day he will be given an anodyne draught, and preferably one containing opium.[1] This will be repeated *pro re nata*. There will be no more cases to-day. Good morning, gentlemen."

The class slowly retired while Dr. P., followed by the two apprentices, made his daily visit of inspection to the hospital wards.

1226 SPRUCE STREET.

BOOK NOTICES.

ESSENTIALS OF NERVOUS DISEASES AND INSANITY: THEIR SYMPTOMS AND TREATMENT. A Manual for Students and Practitioners. Second edition. By JOHN C. SHAW, M.D. Philadelphia: W. B. Saunders, 1894.

A book which has reached a second edition in two years, as this has done, would seem to have "filled a long-felt want." In spite of this, we fail to see how it has done so. In our opinion the most essential things have been omitted,—viz., no definitions and explanations are given of the special symptoms of nervous diseases and the technical

[1] All of the data in the above lecture are historically true.—C. B. W.

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terms applied to them, as the different forms of motor and sensory paralyses, tremors, reflexes, etc., nor are the methods of eliciting these symptoms described. For instance, a beginner in the study of neurology, to whom only the book would be useful, may read that the knee-jerks are absent, but he is left in ignorance of how to discover this, what it is, or what it signifies; he would not know how to test the muscular co-ordination of a patient or the condition of his sensory nervous system, and so on. It seems to us that a work for beginners on laryngology without a description of how to examine the larynx would be about as useful. While the descriptions of the various diseases are good, as a rule, we would take exception to many statements made. For instance, migraine is termed a neuralgia of the fifth nerve. Morvan's disease is classified with neuritis. So important a disease as cervical pachymeningitis we should think worthy of notice, but it is not mentioned. The therapeutic directions are very meagre, and the attempts at illustration worse than useless.

HOME TREATMENT FOR CATARRHS AND COLDS, adapted for use in the Household, and for Vocalists, etc. By LEONARD A. DESSAR, M.D., Visiting Laryngologist to St. Mark's Hospital, etc. New York: Home Series Publishing Co., 1894.

This small treatise has been written with the view of supplying the general reader with a trustworthy guide of instruction for the proper care, prevention, and treatment of catarrhal troubles of the throat, nose, and ears, and their complications. The universal prevalence of catarrh renders the education of the laity in the proper measures to prevent this annoying condition most important. From this point of view the work deserves praise, but we cannot escape the conviction that in combining with this information the directions for treating catarrh the author has made a mistake. It is too much to expect that a patient can estimate the exact form of the trouble from which he is suffering, and as between a catarrh without treatment and the same condition to which is applied this and that remedy in succession, indiscriminately, as the list of drugs which is advised is gone through with, we should prefer the former. We do not think the "home treatment" of any disease, however trivial, advisable. The present work would be valuable to the student or the general practitioner in acquiring a rudimentary knowledge of this common class of affections, but for the reason mentioned it cannot be recommended as a safe work to place in the hands of the laity.

A SYSTEM OF LEGAL MEDICINE. By ALLAN MCLANE HAMILTON, M.D., Consulting Physician to the Insane Asylums of New York City, etc., and LAWRENCE GODKIN, Esq., of the New York Bar, and other collaborators.

It is unquestionably true that no branch of the healing art has been so much neglected as has that which relates to forensic medicine, and this in spite of the fact that many of the questions involved are of

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the greatest importance. Medical jurisprudence is not taught at all in many of our best schools, and it receives but slight attention in others. Those who acquire any knowledge of the subject, therefore, must do so after leaving college. We regret to say that in most instances, owing to the pressure of other work, this information is not acquired. This lack of information is frequently the means of permitting the physician to become involved in difficulties that are at least annoying, if not injurious to his reputation and standing in the community. For the same reason very few physicians are qualified for witnesses in medico-legal controversies. The medical "expert" does not carry the weight in our courts that he should. A better understanding of the jurisdiction of the coroner is also essential. Those who practise in cities particularly are apt to come into conflict with this officer for some transgression unwittingly done.

It has been the object of the present work to supply both the medical and legal professions with a concise yet thorough treatise upon the subjects included under medical jurisprudence. The list of contributors includes many of the most distinguished writers and authorities in medicine and law. As a book of reference it will be found equally invaluable to the physician and the lawyer in the preparation of their cases that go into court.

There has been no exhaustive book on this subject in this country, and Dr. Hamilton's system fills a much-needed gap. The subject of medico-legal inspections and post-mortem examinations is most satisfactorily presented by A. T. Bristow. While avoiding all unnecessary detail a host of points so apt to be overlooked, and which frequently so greatly mar the value of the report, are given proper emphasis. Under death in its medico-legal aspects Francis A. Harris has collected a vast amount of important information bearing on this subject. So much depends on the accurate observation of even the most minute details that a number of cases are given illustrating the important features. A summary of what is at present known of blood and other stains has been contributed by James F. Bradcock. The presentation of the subject of homicide and wounds in every way comes up to our expectations. The chapter on inorganic poisons, by C. E. Pellew, is very complete, as is also that upon alkaloidal and other organic poisons, by Walter S. Haines. A novel feature of the work is the article on the toxicological importance of ptomaines and other putrefactive products, by Victor C. Vaughan. Although a new subject it has already assumed a great importance, and no one is better able to discuss it than Dr. Vaughan. The subject of the medical jurisprudence of life insurance has been carefully presented by Brandreth Symonds. The chapter on accident insurance and benefit associations was contributed by Cortlandt F. Bishop. These are supplemented by a short chapter on the obligation of the insured and the insurer, by R. C. McMurtrie, Esq. The contributions of the author, upon the identity of the living; of Benjamin N. Cardozo, upon identity and survivalship; of William A. Purrington, on certain legal relations of physicians and surgeons to their patients and to one another; and of W. Travis Gibb, upon indecent assault upon children complete the volume. The individual work of the various contributors is excellent, and it follows that as a whole the

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work is worthy of praise. It embodies the most recent knowledge of the subject, without redundancies or statistics. Several colored plates are presented, and numerous wood-cuts and half-tones. The book is well printed on heavy paper, and the binding is excellent. Volume II. is announced to appear shortly.

THE POCKET ANATOMIST. By C. HENRI LEONARD, A.M., M.D., Professor of Gynecology, Detroit College of Medicine. The Illustrated Medical Journal Co., Publishers, Detroit, Mich.

The eighteenth edition of this popular anatomy is now before us. It is printed upon thin paper and bound in flexible leather, so as to be specially handy for the pocket. The illustrations are photo-engraved from the English edition of "Gray's Anatomy," so are exact as to their details. Three large editions have been sold in England, testifying to its popularity there, and some sixteen thousand copies have been sold in this country. It briefly describes each artery, vein, nerve, muscle, and bone, besides the several special organs of the body. It contains more illustrations than any of the other small anatomies.

TEXT-BOOK OF HYGIENE: A Comprehensive Treatise on the Principles and Practice of Preventive Medicine, from an American Stand-Point. By GEORGE H. ROHÉ, M.D., Professor of Therapeutics, Hygiene, and Mental Diseases in the College of Physicians and Surgeons, Baltimore, etc. Third Edition, Thoroughly Revised and Largely Rewritten, with Many Illustrations and Valuable Tables. Philadelphia: The F. A. Davis Co., Publishers.

The third edition of this valuable volume certainly fulfils the author's desire expressed in the preface in meriting the approval of all students of hygiene. Each chapter is replete with useful information, tersely put. Facts well proven are recorded. Vague theories are not discussed. The entire book deserves careful reading, and can but be of the greatest help to every practitioner.

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UNIVERSITY
MEDICAL MAGAZINE.

MARCH, 1895.

SUBDIAPHRAGMATIC ABSCESS DUE TO ABSCESS OF THE PANCREAS. WITH REMARKS ON EFFUSIONS IN THE LESSER PERITONEAL CAVITY.

By J. H. Musser, M.D.,
Assistant Professor of Clinical Medicine, University of Pennsylvania.

To the labors of Prince, of Draper, of Fitz and Senn we owe much for our knowledge of the diseases of the pancreas. They precipitated renewed interest in a study of the affections of this organ. Any contribution, although meagre, is timely, and may shed light on dark places.

This paper will include the report of a case of abscess of the pancreas or, more strictly, of gangrenous pancreatitis, and, in connection with recent remarks of Jordan Lloyd, on effusions into the lesser peritoneum due to pancreatic disease, the report of a case simulating effusions in that cavity.

Case I.—J. F., aged 66; laborer; admitted to Philadelphia Hospital August 4, 1888. Father and mother died of old age. The patient labored in a rolling-mill. He drank in moderation. He had gonorrhea in the army, but denies syphilis. Of fourteen full-term children of the patient, but four are living, and his wife had two miscarriages. The great mortality could not be explained.

For the past thirteen years J. F. had dyspeptic symptoms, chiefly flatulency and fulness after eating. For two years the appetite was poor and morning vomiting occurred.

On admission, the patient suffered from rheumatic pains. He was emaciated and there was some edema of the legs. At the time of admission he also complained of gastric distress. While under observa-

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tion, during the month of August, he suffered from continuous pain in the upper half of the abdomen with tenderness on pressure in the epigastrium and upper umbilical region. The abdomen was moderately distended. There were no other symptoms, and no definite cause for the pains could be made out. The patient came under my care early in September.

September 22, 1888. Without cause the patient suddenly vomited thirty-two ounces of blood. Profound shock followed. The exhaustion was extreme and the patient became very apathetic. Anemia became more striking than the direct loss of blood seemed to explain. The mucous membranes were extremely pale. The red corpuscles were reduced to 1,500,000. The epigastric pain increased. Pulsation of the abdominal aorta was increased and was more marked above the umbilicus. In the left upper quadrant, including the epigastrium to the left of the median line, marked induration could be detected extending downward to a half inch above the transverse umbilical line. The area was dull on percussion. Speaking more accurately, it was bounded on the right by the median line and on the left by the mid-axillary line. The ribs marked the upper limit in the parasternal line, the sixth rib in the nipple line, the seventh rib in the axillary line; and the previously-mentioned transverse line the lower limit. The liver was enlarged slightly. The heart-sounds were very weak, and a low systolic murmur was heard at the mitral and tricuspid areas. The jugular hum was heard. On percussion, in the scapular line posteriorly, dulness began at the tenth rib, and in the post-axillary line at the eighth, extending to the margin of the ribs. The dull area was very tender on pressure, and the seat of constant pain. No signs on auscultation, but heart-sounds well transmitted over dull area. Patient much emaciated. Glands enlarged in groins, but not in any other situation. Scars of general eruption all over body.

October 14, 1888. No change has taken place since the last note. The physical signs in front and the pain and tenderness continue. The dulness behind has extended upward to ninth rib; along vertebral column to tenth rib only. Faint bronchial breathing in upper tip of area. Patient is apathetic, without appetite, very weak, and emaciated. He has had no fever and only a slight cough.

November 1, 1888. No fever. Continuous prostration and emaciation with anemia. Pain and local symptoms continue. Behind the resonance is impaired as high as the eighth rib in the scapular line and to the ninth rib in the post-axillary line. Bronchial breathing more marked.

December 9, 1888. The patient lingered until this date, dying of exhaustion. The physical signs and local symptoms remained. Fever

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was not present and but little cough and expectoration. The splenic region was tender. Emaciation and anemia continued.

Autopsy.—Body of a medium-sized man, very much emaciated, extremely anemic, sallow, cachectic hue.

Peritoneal Cavity.—Remains of an old typhlitis; large bowel adherent to under surface of liver; it then turns on itself, dipping in median line to umbilicus, turning again and becoming adherent to greater curvature of stomach near pylorus, from thence it extends to the left hypochondrium where it doubles on itself and is intimately adherent to a mass which fills up this region behind. The large intestine covers the spleen entirely. The latter organ is included in the above-noted mass. The entire large intestine is distended, except the portion adherent to the mass. This portion is contracted very much, and though intimately adherent is not diseased. The liver is seen in its normal position; the previously described mass is adherent to the under surface of the left lobe. Stomach not much dilated. It contained a grumous fluid. Both the esophagus and pyloric end are free from disease. In the fundus a soft, ulcerating, carcinomatous mass, pale in color, is seen two inches from the esophagus. The mass extended three inches in the long axis of the stomach and is two inches wide. Although this portion of the stomach is bound by adhesions, there is no perforation of the gastric wall; a second nodule was seen in the lesser curvature one inch from the former nodule.

The left kidney and suprarenal capsule, the spleen, pancreas, the contracted portion of the large intestine, the left half of the diaphragm, and the lower third of the left lung were intimately adherent, and removed *en masse* for dissection. The connective tissue about the kidney and suprarenal capsule were unusually thickened on account of chronic inflammation. On dissection an abscess was found occupying the following relation: The upper wall of the abscess was made by the diaphragm and lung adjacent, the lower portion rested on the upper part of the kidney and suprarenal capsule; behind and laterally the spleen composed its wall. The wall of the abscess was much thickened and made up of several layers. This was most notably seen at the diaphragm. Its muscular coat was not destroyed; a pigmented layer was seen in apposition to it, then the true abscess wall, which was dark in color and studded with gray granulations. Between the pyogenic layer and the pigmented layer striations of fatty tissue apparently existed. The pigmented layers in the walls of the abscess were particularly noticeable along the edge of the spleen. The abscess perforated the diaphragm. The pleura over the diaphragm was thickened. The lower lobe of the lung was consolidated. In the centre of the consolidation one large and several small abscesses were seen. The bronchi

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were greatly dilated and the mucous membrane the seat of intense congestion. The end of the pancreas was entirely destroyed and the necrosed portion floated in the centre of the abscess. The abscess contained dark, gangrenous, fetid, semiliquid matter.

Remarks.—Of interest clinically, we must observe first the evidence of a foreign subdiaphragmatic mass, as made out by percussion anteriorly, laterally, and posteriorly. The dulness behind, without bronchial breathing, early in the case was, no doubt, due to the encroaching abscess. The area of dulness was added to later by the consolidated lung. The area of dulness and induration corresponded in situation with the area of effusions in the lesser peritoneal cavity. Although the autopsy failed to show exactly such delimitations, no doubt they occurred, primarily at least. Displacement of the heart was not observed. The carcinoma of the stomach was surmised, but not positively demonstrated. Indeed, the only diagnosis that seemed most probable was cancer of the fundus of the stomach.

There is no doubt, from the appearance of the abscess and the gangrenous pancreas, that the gangrenous pancreatitis was the result of previous hemorrhage into or about the pancreas. This tallies well with the appearance described by different authorities who have published cases of gangrenous pancreatitis, notwithstanding the fact that there was no clinical evidence of the occurrence of such hemorrhage unless it occurred at the same time as the hemorrhage from the stomach. No doubt the second hemorrhage (pancreatic) played a causal part in the profound anemia.

In connection with this case I beg leave to call attention to the remarks of Mr. Lloyd on the subject of pancreatic cyst. In a recent number of the *London Lancet*, Mr. Lloyd calls attention to effusion into the lesser omentum due to pancreatic cysts and to hemorrhages from the pancreas. Indeed, his first observation with reference to the occurrence of effusion was in connection with a case of gangrenous pancreatitis somewhat like the one just reported. He likewise called attention to pain, the occurrence of tumor, and the occurrence of increase in the dulness posteriorly, and with it, on account of the effusion into the lesser peritoneal cavity, displacement of the heart. This latter symptom was absent in the case just reported.

I wish for a moment to call attention to another case which was recently in the wards of the Presbyterian Hospital, with tumor and other physical signs almost exactly like those described by Mr. Lloyd. The patient was a lad, 16 years of age, admitted during the fall of last year. During the summer he had had two rather prolonged attacks of fever, which were said to have been respectively typhoid fever and a relapse. During the second attack of fever, the tumor was discovered

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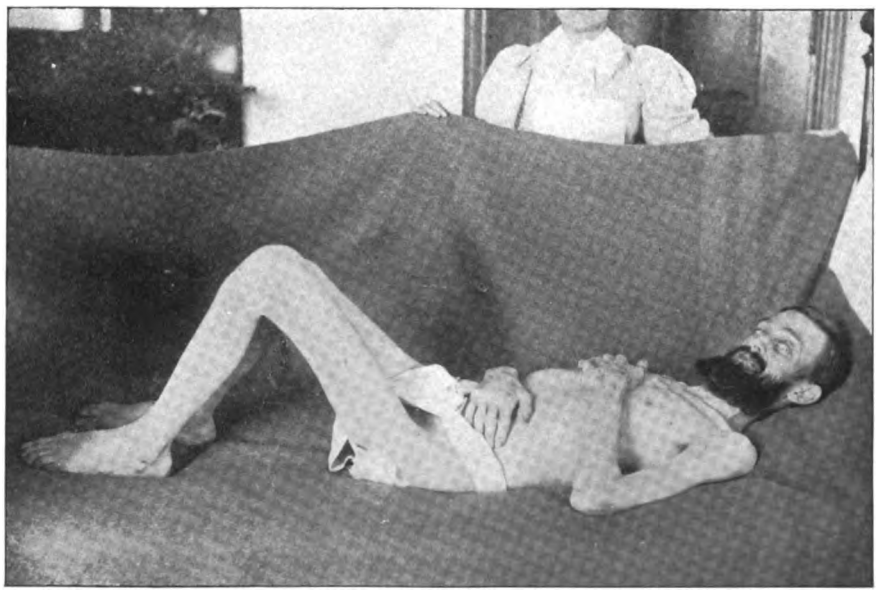
FIG. 1.

FIG. 2.



A CASE OF MUSCULAR ATROPHY FOLLOWING TYPHOID FEVER.

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in the epigastrium and umbilical region. The tumor was somewhat tender on pressure. It occupied very much the position that I have indicated, except that it extended somewhat lower down. In addition to the tumor there was increase in the dulness posteriorly to the ninth rib; there was marked dislocation of the heart. The apex-beat was outside of the mid-clavicular line and above the nipple. The patient improved very much under rest in bed and careful feeding. The tumor, however, remained. The parents would not allow an exploratory operation. I, however, feel convinced from the previous history that the tumor was not due to disease of the pancreas, but that it was a tuberculous tumor, and, in all probability, connected with the omentum. I also feel convinced that there was effusion into the lesser peritoneal cavity giving the characteristic physical signs that I have mentioned. As is frequently the case in tubercular peritonitis, the patient has improved and is gaining in flesh and strength. The tumor is not so distinct as before. This case is of interest in connection with disease of the pancreas, and as calling attention to another cause for tumors in the epigastrium causing effusion into the lesser omentum, or causing physical signs simulating effusion into that cavity.

MUSCULAR ATROPHY AND PERIPHERAL NERVE-CHANGES FOLLOWING TYPHOID FEVER.

By James Hendrie Lloyd, A.M., M.D.,

Physician to the Philadelphia Hospital, to the Methodist Episcopal Hospital, and to the Home for Crippled Children.

The object of this brief communication is to put on record the history of a rather anomalous case, and to exhibit photographs of the patient. Multiple neuritis has been recognized for some years as a possible complication or sequela of typhoid fever. Without reviewing the literature, which is already quite extensive, it is sufficient to say that this recognition is strictly contemporaneous with that universal recognition of multiple neuritis which, during the last two decades, has resulted in placing that affection among the most common of nervous diseases. Among the well-known causes of multiple neuritis are various infectious diseases; yet these vary greatly in their proneness to involve the peripheral nerves. The most common is undoubtedly diphtheria, which causes a distinct type of polyneuritis. Typhoid fever is probably the next in order. The various paralyses following enteric fever were observed, of course, long before their true nature

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was recognized; but they were almost universally ascribed to involvement of the spinal cord.

If it were merely, therefore, for the sake of describing one more case of this easily-recognized complication, it might not be worth while to devote a paper specially to it. It is rather for the purpose of discussing briefly some yet uncertain points in the pathology of the nervous sequelæ of typhoid fever that I have made this case a text. It does not seem to me that all these cases are necessarily cases of pure and simple neuritis, and this one upon which I base this purely clinical discussion possibly was not.

The patient, a man, aged about 30 years, was admitted to the medical ward of the Methodist Hospital in July last. He was under the care of Dr. Westcott, who treated him successfully during a course of exceedingly grave typhoid fever, and to whom I am indebted for notes of the case. He passed into my care when I succeeded Dr. Westcott at the close of the latter's term, on November 1, at which time he had just about reached the end of a second relapse, and was satisfactorily convalescent, with the exception of the nerve-involvement about to be noted. The distinctive features of the case were as follows: The patient's family history was negative; three sisters and two brothers are living and well, and present no trace of muscular atrophy. The patient had had the usual diseases of childhood, and when ten months old he is reported to have had an attack of meningitis. Whatever the cause, he has always been feeble-minded, presenting the grade of a high-type imbecile. The voluntary muscles, however, were not involved; the patient had always been able to walk, and had well-developed legs. In fact, he walked into the hospital when admitted. The diagnosis of typhoid fever was established by a prodromal stage of malaise, headache, anorexia, and diarrhea; by the coated tongue with red tip and edges; and by the fact that when admitted he already had a tympanitic abdomen, increased splenic dulness, a slight cough, and the characteristic rose-colored eruption. His temperature, when admitted, was $104\frac{2}{5}°$ F.

The most salient features noted in the case need alone be discussed. The temperature pursued a course of unusual severity. As shown by the chart, it ranged at its highest for ten days at or above 104° F., only falling slightly at the morning remission or abruptly when brought down by the cold bath. On several occasions it rose to or above 105° F., and once to the extraordinary height, on the seventeenth day, of $106\frac{3}{5}°$ F. This was followed by an apparent crisis, during which, in less than twenty-four hours, the temperature fell to 97° F., almost ten degrees. This was evidently partly due to a plunge bath. The febrile course extended over a period of more than sixty

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days, in which time there were apparently two slight attempts at convalescence, followed by a relapse. It is possible that this extreme hyperpyrexia and this prolonged febrile course are significant in relation to the involvement of the muscles presently to be noted.

On the fifteenth day of the disease the patient had a convulsion. This unusual phenomenon in typhoid fever was without apparent cause in this case. There was no serious affection of the kidneys. The patient, although slightly feeble-minded, was not epileptic. The fit occurred shortly after his temperature had been reduced, for the first time, to the normal point by the cold baths with which he was treated. It is not likely that this treatment, or this reduction of temperature, could have produced an epileptoid seizure. It seems more probable that the patient, although not an epileptic, had an unstable brain-organization, as shown by his mild grade of feeble-mindedness, and that he thus succumbed in a convulsive paroxysm to the influence of the typhoid infection. Thus we know that children, with undeveloped brains and slight resisting power, not unfrequently fall into convulsions at the onset of or during the course of the infectious diseases, especially scarlatina. There is probably some analogy to this tendency in children shown by our patient in his epileptoid seizure. This is not without significance, it seems to me, in its bearings upon the question of the involvement of this patient's neuro-muscular apparatus. Both complications probably indicate a poorly-developed nervous mechanism, which succumbed to the violence of the typhoid poison.

On the nineteenth day the patient had eleven hemorrhages from the bowels, in which he lost several pints of blood.

Later bedsores formed on the sacrum and elbows.

In connection with his paralysis it is interesting to note certain trophic lesions. A spot of dry gangrene the size of a dime formed on the left foot behind the external malleolus. On the right foot, at the same place, a small ulcer appeared. These have been sluggish in character and, although dressed carefully, are still, after four months, unhealed.

Before the paralytic symptoms were noted in the legs pain in these members was severe.

The paralysis began to be noted during convalescence, but it probably began when the patient was suffering with the pains in the legs as early as the sixth week. Painful contractures at the knee-joints began about the same time, and extension was applied.

At the end of the third month the right knee began to swell, and the right leg became edematous: this was not caused by phlebitis. The swelling in the knee continues; the joint is not red nor hot, and it is not painful except on motion. The affection has almost the

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appearance of a spinal arthropathy of mild type. The patient's convalescence has been tedious.

In the fourth month, when I took charge of him, his muscular atrophy was striking. His condition was as follows: Both legs were contractured at the knee, and very painful on any attempt at straightening them. The right knee was swollen, and the right leg edematous. The peroneal muscles in both legs were markedly wasted, as were also the sural muscles. The wasting was worse on the left side. The quadriceps extensor muscle was involved, very markedly so on the left side. The extensor of the toes was not entirely paralyzed. The knee-jerk was almost abolished on the right; much diminished on the left. In the arms and hands power and nutrition were much better than in the legs. There was some wasting, however, of the thenar and hypothenar eminences. Sensation was good everywhere. No scoliosis had occurred. No fibrillation was observed.

The most wasted muscles—*i.e.*, in the sural and peroneal groups—did not respond to either the galvanic or faradic current. In less wasted—but still markedly wasted—muscles there was no serial nor qualitative change, although there was decided quantitative change. A modal change was noted,—*i.e.*, the muscles reacted sluggishly. Hence it cannot be said that there was a typical reaction of degeneration in these muscles, although there appears to have been a partial reaction of degeneration.

The last examination gave the following results:

Electrical examination was made with the galvanic current.

Everywhere in both arms the anodal contraction was greater than the cathodal, and the reactions were practically normal.

The calf of the right leg was greatly atrophied and very flabby, and there was a quantitative decrease in these muscles.

The modal reaction is rather sluggish, but there is no qualitative change. CCc > ACc.

In the extensor muscles there is great quantitative decrease, but no qualitative change.

In the left thigh there is quantitative decrease, but no qualitative change in any of the muscular groups. There is great wasting in the peroneal and sural groups, and the knees are contractured.

On the outer aspect of the left foot there are the remains of a bedsore, consisting of an open suppurating sore filling up with granulations, healthy in color.

On the right hand there are several indolent sores, one especially over the first metacarpo-phalangeal joint, which feels rather thickened.

There is now better use of the hands in extension and flexion than at the first examination (November 14).

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There is marked atrophy of the thenar, hypothenar, and interosseous groups. There is no scoliosis.

The tactile sense is good in all four extremities.

There is no thermal anesthesia except doubtfully on the dorsum of each foot, where the patient occasionally errs in his responses, but not always.

In considering the exact pathology of this case, without an opportunity for microscopic study, I was inclined at first to regard it simply as a neuritis of a type by no means unheard of after typhoid fever. It resembles clinically, in fact, the cases referred to by Sir James Paget,[1] in 1876, when he wrote of the peroneal and ulnar nerves as being especially liable to involvement after typhoid fever. A somewhat similar type—the so-called peroneal type of progressive muscular atrophy—was described by Tooth[2] and by Charcot and Marie[3] at about the same time. Tooth proposed the name "peroneal type" for a form of muscular atrophy which always begins in the peroneal group of muscles, and in which talipes equino-varus is gradually produced. The limbs are cold and livid. Cramps and pains (painful contractures) are seen. Fibrillary tremor may or may not occur, and the reactions of degeneration are present, as a rule. The arms and hands are involved later, the thenar, hypothenar, and interosseous groups being the first to go, the face being spared. Measles was suggested as a cause in one obscure case.

Charcot and Marie noted for this type that it always begins in the legs, predominating not rarely on one side; fibrillary contractions are clearly seen; the electrotonus is abolished absolutely in the wasted muscles, and the reactions of degeneration are present in those partially wasted. They claim that there is an absence of contractures at the joints. There are vaso-motor changes. Sensibility was usually intact in their cases, and pains were present. They appear to recognize heredity alone as a cause.

Ormerod[4] reported three cases of this type of muscular atrophy in one family following measles. The affection invariably began in the legs below the knees, then after some months or even years involved the hands and forearms, and always affected the distal more than the proximal portions of the limbs. Trophic lesions resembling chilblains were observed. Electrotonus was abolished below the knees, and partial reaction of degeneration was seen elsewhere. The knee-jerks were not abolished.

[1] St. Bartholomew's Hospital Reports, 1876.
[2] Brain, Vol. x, p. 252.
[3] Rev. de Méd., Sixième Année, p. 97.
[4] Muscular Atrophy after Measles in Three Members of a Family, Brain, Vol. VII, p. 334.

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Autopsies, made by Virchow, Oppenheimer, Friedreich, and others, have disclosed in cases of this peroneal type an interstitial neuritis.

Ross[1] claims that the typhoid poison shows a special predilection for the peroneal and anterior tibial nerves.

An attentive study and comparison of my case with those of others, and comparison of these with one another, are not entirely convincing as to the identity of the pathological process in all cases. The peroneal type of muscular atrophy following measles or caused by heredity has been ascribed usually to a peripheral neuritis. The presence of fibrillation, the absence of anesthesia, the preservation of the tendon reflexes, and the partial character of the electrical changes do not support the view satisfactorily that the peripheral nerves are always or alone at fault. It is possible that the muscular tissue itself may be at fault in some of these cases, as we know, from the researches of Zenker and others, that the voluntary muscles undergo grave changes in typhoid fever.[2] This possibility, I am convinced, has been too much overlooked in the discussion of these cases. In my own case, while an hereditary element cannot be traced, the personal antecedents of the patient were bad. He already was suffering from a badly-developed nervous system, and this partial arrest of development may have served as well as an hereditary defect to precipitate rapid degeneration of nerve and muscular tissue under the evil influence of the typhoid poison. It may be, in fact, a question whether the process is entirely inflammatory as distinct from degenerative. Hoffmann, apparently with a kindred idea, proposes for such cases the name of progressive *neurotic* muscular atrophy. This is not a question of purely pathological interest; the prognosis is involved. The peroneal type of muscular atrophy, whatever its exact pathology, is an inveterate and progressive disease; whereas a simple multiple neuritis is a curable affection.

The Centenary of the Discovery of Vaccination.

The directors of the German Vaccine Institute, at Weimar, are arranging for a celebration, to be held in 1896, in commemoration of Jenner's discovery of vaccination. In connection therewith there is to be an exhibition of old and new vaccine instruments, of apparatus for the preservation of lymph, etc.; of original manuscripts on small-pox and vaccination; on the inoculation of sheep-pox and cattle-plague in pre-Jennerian days; of squibs on vaccination, of medals, portraits, and autographs of prominent inoculators, vaccinators, and anti-vivisectionists, etc.—*Medical News.*

[1] Transactions of the Association of American Physicians, Vol. III.

[2] For a discussion of this subject see Luquet's Thesis, Des Altérations Musculaires se rattachant à la Fièvre Typhoïde, Paris, 1882.

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A DESCRIPTION OF SOME OF THE MOST IMPORTANT OPHTHALMIC METHODS EMPLOYED FOR THE RECOGNITION OF PERIPHERAL AND CENTRAL NERVE DISEASE.

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The methods for the determination of the ocular signs of general neuroses and related symptomatic local disorders divide themselves into four groupings. The first, by reason of the comparative anatomical simplicity of the structures to be studied and the ease of recognition of related physiological action, constitutes the most important and the most readily understood of all of the ophthalmic methods that are employed in the objective plans for the determination of the physical conditions of the sensory groupings of the visual apparatus. The second, which in reality is a direct sequence of the first, consists in the contrivances and plans that are intended for the recognition of the various subjective sensory symptoms of the apparatus. The third, the least complex and the easiest of comprehension of the entire grouping of procedures, is the series for the determination of the objective motor symptoms. The fourth, though in fact at times constituting the most important of all the clinical methods, consists in the plans that are necessary for evolving the existence, kind, and degree of the subjective motor groupings.[1] Thus subdivided, the methods for research can be easily understood, and the significance of the findings can be readily realized. Not that any one plan can be relied upon to give proper answer as to the causal lesion: not that any single grouping of simple procedures is sufficient to vouchsafe an adequate diagnosis. Each form of relevant physiologic action and every variety of related anatomical structure must be carefully studied and conscientiously looked at *seriatim* by the aid of some of the most important and the best adapted clinical methods. This, done not only once, but repeatedly and at regular intervals from the very first suspicion of neural disorder, will, when carefully performed by competent observers, frequently afford much clinical data towards the correct and early diagnosis of grave nerve-disease that ofttimes may thus be checked by appropriate hygienic and therapeutic measures.

[1] The topics in this monograph are so arranged that the reader may at a glance be able to group those methods of precision that pertain to the recognition of allied conditions, thus placing the entire subject-matter in a logical and definitive order, a plan that becomes eminently useful in the careful study of the various neuroses. Of course, every case should be submitted to a routine plan of examination.

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Objective Determination of Sensory Symptoms.

Taking the plan for the objective determination of the sensory groupings first, we are at once placed before the most important, the most comprehensible, and the most pretended of the procedures,—ophthalmoscopy.

Given a good instrument and a carefully-trained eye, the observer has an ample opportunity set before him in the vascular and the neural circles spread before his gaze to formulate correct opinions not only as to the character of local disease of the intra-ocular media and tunics, but as to the character of many general disorders that are prone to afford intra-ocular expression of their ravages.

For this purpose there are two methods. One is known as the direct or upright method, where the observer looks directly upon an upright image. The other is termed the indirect or inverted plan, where an aerial image or an indirect picture, which is both inverted and reversed, is seen. In the former, the observer, who should be upon a somewhat higher level than the patient, sits at the side and slightly in front of him. The source of illumination, which should be single and steady, is to be placed at the back and to one side of the patient, so that his eye is in shadow and that an angle of about fifteen to thirty degrees is formed between the patient's eye, the observer's eye, and the light. The observer should next so place his instrument before his own eye with the mirror partly facing both the patient's eye and the light in such a way that he can look directly through the sight-hole of the instrument into the pupil of the patient's eye. If this has been done correctly, the patient's pupil will, if clear, become almost uniformly red in appearance. The observer thus knows that he has illuminated the interior of the patient's eye, and that he has, in consequence, obtained the so-called red fundus-reflex. The increased power of magnification of the apparent size of the fundal elements over the continental methods of ophthalmoscopic study by this method may, by proper contrivances,[1] as suggested to the writer by Dr. S. Weir Mitchell, be still more greatly enlarged, so as to examine almost microscopically any specially desired detail, thus rendering this method far better than the indirect plan.

To properly employ the direct method, the observer should first search for changes in the cornea. By employing a sixteen- to thirteen-diopter-strength lens in the instrument and gradually decreasing the focus of the lens to twelve-, ten-, and nine- diopter strengths for the anterior capsule, the cortex, nucleus, and the posterior capsule of the lens,

[1] The writer, at the suggestion of Dr. Mitchell several years ago, is at the present time perfecting such an instrument.

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most of the structures in the anterior segment of the eye can be successively studied. The lens-strength should then be weakened as the vitreous chamber is more and more deeply penetrated. As soon as the fundus is reached, the optic-nerve-head is the first portion to be sought for. This can be easily accomplished by following the course of one of the main retinal stems up to that portion of the eye-ground that appears like a pinkish-white gray plaque or disk. Found, its apparent size, measured in a number of diameters of one and a half millimetres each (which represents its real size), should next be noted. Its axis of greatest length as gauged from a horizontal zero, the comparative tints of its different quadrants, its irregularity of surface contour, the distinctness of its borders, and the degree of pigment absorption beyond its edges, should all be accurately recorded. In fact, any normal or abnormal condition, both neural and vascular, that may seem worthy of notice, should be carefully registered upon suitable blanks. The comparative sizes of the retinal vessels, the relative tint of the contained blood, the thickness of the channel-walls, their tortuosity and waviness, the widths of the light-streaks, and the visibility of the lymph-sheaths next demand attention. The appearance of the macular region with its contained yellow spot, the general tint of the fundus, the amount of absorption of pigment epithelium, the degrees of choroidal disturbance, the character of the general opacification of the retina,—especially any increase in the thickness and the visibility of its fibre-layer,—and the kind and amount of ametropia should be registered in every case. If to these—the ordinary variations in fundus-structure, which serve as the basis upon which to build, as it were, any pathological conditions—be added all gross changes as tersely and as clearly expressed as possible, this form of ophthalmoscopic record becomes, in due proportion to its degree of completeness and correctness, a valuable guide to both the general and the special student in neurology.

Should desire be had for a large field of vision in which accurate details are not necessary,—as, for instance, to obtain a general view of the appearance of the fundus, just as is so frequently done by weak objectives in topographical microscopy,—the other method may be employed, where, instead of directly approaching the patient's eye with the ophthalmoscope and looking directly upon the fundus, the instrument is held at some forty-five to fifty centimetres away from the eye to be studied. By this plan, the details of the fundus are projected into the air as an inverted and reversed image. As so much of the eye-ground is given at a single glance by this plan, thus offering a better idea as to the exact location of pathological changes, it should always be employed by the special investigator.

To obtain the best results by the inverted method, there should be,

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as in the first plan, a single source of illumination. If desired, an incandescent loop of electricity of about sixteen to twenty candle-power, which, whilst not being too intense in illumination, closely simulates ordinary solar light, can, just as in the other method, be used.[1] The source of light should be so placed at the back and to one side of the patient that his eye is in shadow. An ordinary concave mirror ophthalmoscope is then to be held directly in front of the observer's eye, so that he can look through the sight-hole of the instrument. The observer should be seated at about fifty centimetres' distance in front of the eye to be examined. If a strong biconvex lens is held in the observer's other hand between the eye to be examined and the instrument, a small inverted and reversed aerial image of the details of a large area of the patient's fundus or any other portion of the interior of the organ situated in the so-called ophthalmoscopic field, will be seen. By constantly changing the relative positions of the mirror and the lens with the light and the patient's eye, both the lateral extents and the antero-posterior portions of the ophthalmoscopic area can be successively searched for pathological change. If an enlarged field of illumination, though, of course, not so brilliantly an illuminated one, be desired, a plain mirror can be substituted for the concave one.

If the observer is able to sketch or to paint, much aid may be offered to him in the future conception of the ophthalmoscopic pictures by making either careful drawings upon prepared sheets, as in Haab's plates, which are composed of superimposed layers of chrome-yellow and cinnabar over sheets of a dull white ground, or pen-and-pencil sketches that are designative of the most important changes seen. To assist him in this, Tiffany's sketching blanks, which are ruled in proportionate size to the apparent magnification in the upright image, may often be useful. Bellarminoff's method—a mere modified revival of the old plans of orthoscopic study—of examining the fundus of the eye by pressing a piece of plain glass against a cocainized cornea so as to flatten that membrane and thus allow the details of the eye-ground to become visible, might under certain circumstances be of value where no better instrument of precision is at hand. Here, however, the details are quite minute in size,—a difficulty, nevertheless, that might be lessened by the employment of a magnifying lens in front of the sheet of glass.

One of the most important methods for the objective detection of changes in the sensory portions of the visual apparatus, is that known

[1] The writer prefers this illumination to the yellowish-red light by the burning of impure carbohydrogen compounds. Of course, however, this is a mere personal preference that the reader is not asked to coincide with.

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as oblique, lateral, or focal illumination. In connection with ophthalmoscopy, it lays bare, with the exception of a small ciliary zone, almost the entire internal tunics and refracting media of the eye. With it, the appearance of the entire anterior external segment of the eye, the cornea, the aqueous, the iris, almost all of the lens, and much of the forward part of the vitreous can be brilliantly illuminated and magnified. Irritation signs of neural and vascular types, such as epithelial thickenings, swellings, and venous and arterial engorgements, atrophic areas, as shown by denudations of epithelium and blanching and discoloration of tissue; and evidences of old inflammation, as recognized by vascular engorgements; deposits of false material and thickenings and thinnings of normal structure; all can be made evident and are readily differentiated by this method.

One of two plans may be pursued. The first, which is the less preferred, is that by concentrating diffuse daylight upon the affected portion of the organ. The second is that which is accomplished by bringing some of the rays from an artificial illuminant to a focus upon the area that is desired to be the more plainly seen. To do either of these successfully, a strong planoconvex or biconvex lens is held at or about its focal distance from the eye in such a position that the impinging light rays may be concentrated upon the part that is desired to be studied. A second lens of about the same strength or much stronger, as, for instance, the so-called "corneal loupe," can then be held at right angles to the illuminating lens in such a position that the observer can look through it at the underlying ocular tissues. If properly done, a highly-magnified and brilliantly-illuminated image of the part looked at will be obtained.

An excellent plan to determine the existence and the exact position of any area of denudation of the deeper-lying conjunctival and corneal tissues can be taken advantage of by the employment of a drop or two of a 2-per-cent. solution of a sodium or potassium salt of fluorescin. When employed, care should be taken to wash the excess away by some distilled water. If this be done properly, it will be seen that the drug has the power to stain any denuded surface of corneal tissue a deep greenish yellow, whilst it causes breaks in the bulbar and tarsal conjunctivæ to become yellow in appearance.

Where gross lesions about the orbit, as, for instance, when neoplastic formations in the maxillary antra are suspected, advantage might be taken of the recent proposition of transillumination by electric light. A guarded loop of about five to ten candle-power can be carried far back and up into the nasal fossa. When in this position, the loop can be rendered incandescent. If the procedure be properly done, a coarse configuration of the bony cavities can be well made out

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and the globes may become partly translucent. In this experiment, the pupil frequently remains dilated and emits a red glare known as Davidson's sign. If there be any degree of lessening of luminous perception, Gavel's sign is said to be present.

In some cases, it may be of value to make a spectroscopic examination of the interior of the eye. This, it is said, can be done by interposing a spectroscope in the path of the return rays from an ordinary ophthalmoscope into the observer's eye. By some, it is believed to be of use in the differentiation of hemorrhagic from other forms of intra-ocular extravasation.

Subjective Determination of Sensory Symptoms.

Passing to the recognition of the next most important series of symptoms,—the subjective sensory,—the observer will at once encounter what at first sight seems the easiest and the least troublesome to obtain. Owing to these facts, the various procedures are so loosely sought for, and the different results are so imperfectly expressed, that a brief though complete detail of the most important of the methods is necessary. First in the list, is the determination of central vision for form.

To accomplish this properly, test-letters are to be employed. The best are based upon the fact that as the smallest angle of distinct vision for a normal eye is equivalent to one minute in width, the exact circular area produced by any pencil of light at increasing distances increases in just such proportion,—in other words, the greater the distance, the greater the area of the one-minute angle must be. In consequence, therefore, every object to be seen distinctly under the angle of minimum visibility, as it is called, must embrace the one-minute area at its equivalent distance. Thus, a letter whose strokes represent a width of one minute at one meter's distance from the eye, must be double the size to be properly seen at two metres' distance, etc.

These letters, known as optotypi or test-types, are so arranged in sequential order of size, that fractional values of the degree of visual acuity can be readily obtained. To do this correctly, the card is to be suspended upon a well-lighted wall in such a way that the patient has his back to the source of light, and his eyes on a level with the smallest type that is intended to be seen at the chosen distance. One eye should be tried at a time. Care should be taken that the fellow eye is secured from participation in vision by a bandage or a shade. Preferably, the vision of the supposed weaker organ is to be tried first. All the examinations should be made both with the vision uncorrected, and when it is corrected by appropriate lenses.

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If, as is preferred by some, artificial illumination be desired, the source of light should be shaded from the patient by an appropriate shade. Should the test-types be ruled to decimal divisions, as they are in the writer's series, the patient is to be placed at five metres' distance from the card. Should he be able to correctly call the letters in the five-diopter line of type at the five meters' distance, his vision is said to be normal. The way this is expressed is in the form of a fraction, using the number of meters employed as the numerator, and the size of the type seen as the denominator: thus, $\frac{5}{5}$ or $\frac{5}{v}$, signifying $\frac{1}{1}$ vision. If the smallest line of type seen at five meters' distance is the ten-diopter line (that is, what a normal eye can recognize at ten meters' distance), the fraction would read $\frac{5}{10}$, denoting $\frac{1}{2}$ vision. If the forty-diopter line be the smallest type that can be seen at five meters' distance, the fractional value would be one-eighth, as specified by $\frac{5}{40}$. Should it be necessary to bring the patient nearer to the card to see the forty-diopter line of type, the actual distance necessary to bring him to, should be used as a numerator with the 40 as the denominator. Thus, if the new distance be two meters away from the card, the fractional value would read $\frac{2}{40}$, stating that the patient had but one-twentieth of normal vision. If vision be still more defective than can be obtained by the cards, the patient should be made to count the number of fingers that the observer raises and constantly varies; the first essay being made at five metres' distance with the patient's back to the source of light. If vision be still lower, the patient should be made to gaze at a single source of definitely-graded illumination in a darkened room. The farthest distance that the light can be recognized is to be noted as "Light perception at —— meters." If vision be still more defective, the patient is to be brought directly up to the source of illumination and wheeled around so that he faces it. A strong convex lens is then to be held directly in front of the eye, and varying strengths of concentrated light are to be brought to play upon the organ at different angles and meridians. If the patient fails to recognize any difference, and if he cannot tell when the eye is shaded and when it is exposed, it is probable that he cannot see at all, and the result should be noted with the word "Blind."

In all of this work it must be definitely understood that, dependent upon the patient's occupation and trained mode of employment of his eyes, there is a marked difference of practical value between the real visual equivalent and the necessary functional one.

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In many instances, it is of value to study what is known as direct vision for color. To effect this easily and properly, sheets of gauged color squares, similar in size to those of the test-types, or contrivances intended to expose definite areas of colors, are to be employed.

The average area to be exposed for the recognition of a few of the most important colors used at five metres' distance is $2\frac{2}{8}$ millimeters exposure for red; $8\frac{3}{16}$ millimeters for blue; $10\frac{9}{16}$ millimeters for green; and $22\frac{9}{16}$ millimeters for violet. Cards with these quotients arranged at five-diopter differences in size can be made and used in the same way for ordinary routine use as test-types. In all of these tests, just as in those for the determination of central vision for form, note should be made whether any manifest refractive error has been corrected or not.

In all cases, especially where there is any suspicion of subnormal color-perception, more careful testing becomes necessary. The easiest and most comprehensible method is that with the color yarns of Holmgren. Three large skeins,—light green, purple, and red,—known as "test-skeins," are to be separated from a bundle of smaller pure and confusion skeins, which have been promiscuously thrown upon a large flat table. The patient is first requested to match the green, then the purple, and lastly the red skein as near as possible, without naming the colors. If any abnormality in the color-sense be present, it will soon evidence itself by the choices that the patient makes. Holmgren says that if the first two tests show a decrease of the color-sense, the last can be omitted.

An easier and more accurate method, and one that is less expensive as to material and to time, is that almost daily pursued by the writer. In this test, there are but twenty-three skeins, eighteen of which are match-skeins, and the remaining five are test-skeins. The five test-skeins are pure green, pure red, rose, pure blue, and pure yellow. One or two choices among the match-skeins are to be made for each of the principal tests. Where absolute accuracy as to the degree of the color-sense is not necessary, the first three tests only need be employed. Each skein is designated by a mark that can be understood by the educated examiner, and also, just as with the test-type, is made intelligible to the whole ophthalmic world. Each skein is so dyed that its color-equivalent is absolutely fixed, and all of the match-skeins are of the same relative intensity, thus preventing the patient from judging a tint by differences of shading,—a power that such subjects possess to a remarkable degree.

In many cases of hemicrania, where the patients are intelligent (and, fortunately for the observer, this is the class of subjects in whom

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this series of phenomena is most often found), much information can be gotten as to the character and the position of the disorder by close questioning as to the direction of movement of paresthetic and anesthetic areas, both in their onsets and disappearances. Study of the coloration and the configuration of the phosphenes, the order of the visible expressions of the attacks, etc., are all of value.

In contradistinction to the plans for the determination of direct vision for form and color, those for the proper recognition of peripheral or indirect vision should also be studied. The art of obtaining such answers is known as perimetry. The procedure can be effected in three different ways, all having the one principle of a fixed point upon which the patient must gaze whilst a peripheral object is being brought into view. The easiest, and the way that the observer will most frequently be brought into contact with in the bedroom, is, where there is not any special form of apparatus. Here the patient can be made to gaze steadily at one of the observer's uplifted fingers, held at about thirty centimetres from his eye. This done, the observer moves a small color-slip or his own upraised finger-tip inward in various directions towards the fixation-object. This plan is of frequent use where rough and ready tests for the mere determination of gross changes in the field of vision are desired.

The next most useful method is that with a ruled black-board which has been gauged into some definite form, as, for instance, into concentric circles of five-degree differences of separation, or squares of seven and a half centimetres each.

In the centre of the board there is a cross which serves as a fixation-point. Definitely-sized areas of squares or circles of various colors, fastened on long black rods, are then to be gradually moved from the periphery of the board in towards the central point until the color is properly named. The moment that this is done, a chalk-mark—preferably the initial letter of the color employed—is to be made on the board at the point where the color has been correctly designated. All the marks for the same color are to be connected to one another by lines. Transcripts upon proportionately ruled miniature board-blanks can then be made for future reference. One eye is to be tried at a time, always choosing the more defective one first. The other is to be carefully excluded by a turn or two of a roller bandage or a handkerchief. The board should be placed in a good light and at such an angle that the patient's head and body do not cast any shadow upon it. The physiological blind spot should always be searched for, and its position and size are to be accurately noted. Areas of dimmed and blind spots, or scotomata, as they are called, are to be carefully sought for, especially for the colors red and green. This can be done by moving

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the little color squares or circles over the entire field area. If blind spots are determined, they should be noted in their respective positions upon the blanks.

The third plan, which is extremely valuable when careful scientific study with the fewest loop-holes for error is necessary, is that where some form of the so-called perimeter is employed. The plan is practically the same as in the other two methods, differing merely in the technique that is necessary for the peculiar mechanism at hand. Some of the best forms of perimeters have self-registering apparatuses into which the little register-blanks can be slipped.

In all of this work, the color areas should be frequently changed, tried at various distances from the eye, under varying grades of external stimuli, and substituted for one another in numerous ways.

Should vision be so low that it becomes merely quantitative, and no definite form can be recognized, the field of light-projection, as it is termed, should be mapped out. This can be accomplished in the same manner as with form and color, except that here the fixation-object is made by having a point of strong light-stimulus, such as a candle-flame. The movable object to register the periphery and the scotomatous areas of the field, should be some form of equally strong light-stimulus. The registries are to be made in the same manner as in the other methods, except that here the notes are designative of "candle field" or "quantitative field for light." If possible, graduated beams of light should be used. Another good plan to accomplish the same purpose is to place the patient in the ordinary ophthalmoscopic position, and have him gaze directly ahead. The unused eye should be carefully covered. A beam of light from a concave, or if weaker stimuli be desired, a plane mirror, should be flashed upon the exposed eye from various peripheral points whilst the patient is made to gaze directly ahead. The varying positions of the light are then to be named without allowing the patient to move the eye away from the fixing point. A rough field of light-projection, which is often of incalculable value in many cases of marked nerve-disease, is thus otained.

In addition to the above methods for the subjective determination of the conditions of the sensory portions of the visual apparatus, there are several other plans which are of importance in the recognition of central and peripheral nerve-disease. These, which are frequently omitted from routine ocular examination, are combined in the study of the sensibility of the superficial portions of the organ and its *adnexa.* For this purpose, esthesiometers of various kinds, with specially adapted points for the cornea, can be used to determine sensibility. Wisps of cotton, carefully twisted and coiled upon the corneal surface without touching the lid-edges, may be employed to study the sensibility of

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this membrane. Local thermometry on and around the anterior face of the eye, can frequently be used to great advantage in the ready recognition of atrophic and degenerate areas from peripheral nerve-disease. Again, if local inflammation be present, pressure with the finger-tips upon or over the affected parts, may often evoke its presence by evidences of tenderness and pain.

(To be concluded.)

THE NERVOUS ELEMENT IN ORGANIC DISEASE.[1]

By Theodore Diller, M.D.,

Pittsburg, Pa.,

Physician to Department for Nervous Diseases, Pittsburg Free Dispensary; Visiting Physician to St. Francis's Hospital, Pittsburg; Member of the American Neurological Association, etc.

In accepting the kind invitation to deliver an address before this society, I am moved to select for a subject "The Nervous Element in Organic Disease," because there is no other upon which I could speak which I believe would be more apt to interest every gentleman here. The subject is a very large and important one, and, you will of course understand at the outset, must, in the time I shall feel at liberty to consume, be presented in a very fragmentary and incomplete manner.

It is very largely an arbitrary matter as to which affections we shall call nervous diseases. If all affections which exhibit nervous (including mental) symptoms were to be called nervous diseases, it would puzzle me very much to name a single one which could not be called a nervous disease. At the mere mention of such common diseases as pneumonia, typhoid fever, erysipelas, diphtheria, rheumatism, Bright's disease, or phthisis, one can readily recall nervous symptoms which play a *rôle* in each.

The nervous system is a great hierarchy of which the brain is the great central, receptive, co-ordinating, and emissive organ. All peripheral stimuli reach the central nervous system; all functional activities are under its control, directly or indirectly. The nerve-cell is the unit, and just as the nerve fibre is merely the prolonged process of the nerve-cell so the various organs—*e.g.*, muscles—may, in a sense, be considered as nothing more than modified end-organs of peripheral nerves. So I think you will all agree with me that no disease process can

[1] Address delivered, by invitation, before the annual meeting of the Beaver County Medical Society, January 10, 1895.

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be present without in some measure producing more or less disordered action of the nervous system, whether or not it gives rise to appreciable symptoms. We do not, however, call all affections nervous diseases which exhibit nervous symptoms, but restrict the term, in the arbitrary way to which I have already referred, to diseased processes which have their seat in the nervous structures proper, or which (like spinal caries, cerebral aneurism, etc.) involve them secondarily by direct contact or pressure.

There are a certain number of nervous diseases underlying which there is no known or constant anatomic basis, and which are called idiopathic. To my mind it is quite clear that there can be no functional disturbance without preceding or at least accompanying structural change. So, according to my thought (and this opinion has now, I believe, gained a strong hold upon the profession), the word idiopathic should be used to mean diseases whose pathologic changes are unknown, and which, at present, are known to us only through the symptoms they present. Examples of such diseases are neurasthenia, chorea, epilepsy, hysteria, mania, and melancholia. With advancing knowledge of chemistry, pathology, and methods of investigation, the list of these so-called idiopathic diseases will diminish as it has done in the past. Only recently paralysis agitans has been taken from the list, and it seems likely that chorea will not much longer remain an idiopathic disease.

It is of certain idiopathic diseases that I wish particularly to speak,—viz., epilepsy, neurasthenia, and hysteria. While these diseases are idiopathic, they are often—much more frequently than many physicians imagine—simply engrafted upon gross disease of some sort of the nervous structures themselves or of other organs of the body. To repeat, epileptic, neurasthenic, or hysterical symptoms may be prominent, chief, or the only symptoms of organic disease. I have myself been more than once humiliated by failing to recognize the underlying gross pathologic changes which directly or indirectly produced epileptic, neurasthenic, or hysterical symptoms. Let me briefly consider each of these subjects separately.

Epilepsy is always a symptom, never a disease itself. If this great, cardinal truth be borne in mind, we will be much more apt to give to each case which comes under our observation a painstaking and critical observation. We know that epileptic or epileptoid convulsions may result from a great variety of organic changes,—*e.g.*, tumor, abscess of brain, various inflammations, and thickenings of vessels and membranes of brain, porencephaly, sources of irritation in eye, nose, ear, penis, etc. Epilepsy may be the first symptom of apoplexy, paralytic dementia, brain syphilis, hysteria, uremia, cerebral palsy of childhood,

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and several other affections. Reasoning from analogy, it seems to me likely that the so-called pure idiopathic epilepsies will, when our knowledge goes so far, be found dependent upon a considerable variety of microscopic changes rather than a single or definite change.

Briefly stated, some of the chief points to be considered are these: The age at the onset of first convulsion and duration of same; the frequency, duration, and mode of onset of all convulsions; the presence or absence of consciousness during a convulsion; the mental and physical condition of patient during the interim; lastly and very important, any changes in the character of the convulsions is to be carefully noted. It is well in all cases to make an examination of the eye-grounds.

The more critically one examines his cases of epilepsy, the fewer cases of idiopathic epilepsy does he have in proportion to the total number he sees. Already we have set aside in a separate class by themselves the so-called Jacksonian epilepsies, characterized by successive involvement of group after group of muscles in orderly sequence, stopping short, usually, of a general convulsion, with preservation of consciousness throughout the attack. This form of convulsion points frequently to a local area of brain irritation, and often demands an operation.

The convulsion of the cerebral palsy of childhood is frequently one-sided, and it is usually prolonged; hemiplegia, athetosis, mental and moral symptoms along with them, render the distinction easy. The convulsions of childhood should in no case be lightly regarded, as they may represent the beginning of cerebral palsy of childhood or of essential epilepsy.

Syphilis or brain tumor should be suspected when convulsions begin for the first time after the age of 30. The history, together with the mental and physical symptoms, will usually enable us to attribute the convulsions of paralytic dementia to the proper source. The convulsions of hysteria may be recognized by their nature and the presence of the stigmata of the disease.

It sometimes happens, in spite of the most critical observation of which one is capable, that gross organic disease will be diagnosed idiopathic epilepsy. At least, such is my own experience. A short time ago, together with Dr. J. J. Buchanan, I reported to the Pittsburg Academy of Medicine a case which I had observed for over a year and regarded as one of essential epilepsy, in which the autopsy revealed a tumor in the centrum ovale the size of a hen's egg.

Neurasthenia is, I believe, brought about by the three factors of exhaustion, starvation, and poisoning of nerve-centres. The morbid anatomy of this affection is so inconstant, so little known, that it must

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to-day be accounted one of the idiopathic affections. Because the symptoms are so variable, so inconstant, some eminent authorities, notably Gowers, have refused to call by a separate name the symptoms which have usually been described under the name of neurasthenia. Yet the stubborn fact remains that we see these symptoms,—headache, morning tire, loss of energy, insomnia, lessened power of attention, intolerance of light and sound, lessened inhibitory force, digestive disturbances, tremors, and a host of lesser ones,—which indicate, certainly no one will dispute, that the nervous processes are greatly at fault. Try as we will, a large number of these cases cannot be placed under the head of the name of any other disease except neurasthenia. It is noteworthy, too, that some of those who so vigorously contended against both the name and disease neurasthenia have turned face and now acknowledge both, a conspicuous example being Dr. Thos. Dowse, of London, who has recently published a most excellent little treatise on the disease.[1] Practically, the name serves a very useful purpose, although it may lack exactness and indicate only symptoms rather than the underlying cause of the symptoms. The term is somewhat comparable to dyspepsia, a name used to describe a more or less definite train of symptoms arising from various organic or nervous disturbances of the intestinal canal, or which may be present in the absence of any known or discoverable changes or causes, and which must be called idiopathic. The term dyspepsia, if used in its proper sense and advisedly, is a useful one and does not create confusion. For example, we can say A or B has dyspepsia or dyspeptic symptoms. Further observations may enable us to say Mr. A's dyspepsia results from cancer or catarrh of the stomach, or it may baffle the best of us to disclose anything as to its origin, when we can continue conveniently to employ the term dyspepsia.

In like manner neurasthenia is used to describe a more or less definite train of symptoms, which in the case of A may be due to organic changes in the heart, lungs, liver, etc., or may rest upon no definite discoverable organic change. So I would suggest that the term neurasthenia be employed when careful search fails to reveal organic disease to which the symptoms may be chargeable; and that the adjective, neurasthenic, be employed when symptoms are apparently arising from some definite organic change.

Perhaps in time to come, with advances in pathology, chemistry, etiology, and methods of diagnosis, the term neurasthenia may with dyspepsia be dissipated entirely. But that time, I think, is not very near.

[1] Brain and Nerve Exhaustion (Neurasthenia).

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While I believe so strongly that neurasthenia is a useful term by which we must call many of the cases which come under our care, I believe I am fully alive to the dangers which its admission opens to us. Already there is a marked tendency to call neurasthenia affections which should not be so called, and which careful and critical examination would reveal to be some definite organic disease presenting more or less prominent neurasthenic symptoms. Even cases which at first appear to be pure neurasthenia often show themselves subsequently to be organic affections. The name neurasthenia, like malaria and hysteria, offers a haven of rest for the careless or ignorant clinician.

So it should be our duty in all cases which come to us presenting symptoms of neurasthenia to search carefully and critically, by all means at hand, for gross organic changes, and direct our measures of treatment against them. I venture the broad assertion that certain neurasthenic symptoms may be seen in nearly all chronic gross organic diseases. Who has not observed headaches, backaches, disordered digestion, disturbed sleep, morning tire, loss of energy, morbid fears, vertigo, etc., in connection with chronic diseases of the lungs, liver, kidneys, womb, or ovaries?

Accepting exhaustion, starvation, and poisoning of nerve-centres as the underlying causes of neurasthenia, it seems to me we can on theoretical grounds account for their production in various chronic organic diseases. In the first place, some mental changes (as a rule stopping short of insanity) frequently occur as the result of the fears, anxiety, and worriment the disease and the knowledge of its presence are apt to induce; the habit of introspective thought is apt to be brought about; then, too, the disordered metabolism with the greater or less toxemia furnishes the poison factor for the nervous centres in both brain and cord. The condition induced in the central nervous system by these changes in mental activity and this toxemia render it less capable of doing the work which is required of it and less able to appropriate from the more or less vitiated circulation the materials necessary for renewal. Exhaustion and starvation result. The *modus operandi* probably varies in different cases. For example, the nervous system may be inherently weak (the so-called neuropathic constitution); there may even be some inherited neurasthenia. In such a case the nervous control over various organs and their functions being in various ways and degrees disturbed, metabolic changes occur which result in producing toxines, which in turn harmfully react on the already disordered nerve-centres and make bad matters worse.

The fact must not be lost sight of that a sufferer from pure or idiopathic neurasthenia may, just as the hysterical individual, become the victim of an independent organic disease apart from neurasthenic symptoms being merely the beginning of such disease.

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Before considering hysteria I wish briefly to recount the features of a case which came under my observation while I was preparing this address, which admirably illustrates how organic nervous disease may simulate neurasthenia. The case is that of an oil-driller, who was sent to me by Dr. J. A. Lippincott, complaining of loss of sexual power, insomnia, general loss of strength and energy, vertigo, spinal pains, various paresthesiæ, morning tire, inability to concentrate thought. He was the victim of morbid fears and introspective thought, and, as the result, had consulted a number of quacks and tried various remedies suggested by his friends.

At first sight, the case seemed one of sexual neurasthenia. But a more critical examination revealed total absence of knee-jerks and Argyll-Robertson pupil, while Dr. Lippincott's report showed that he exhibited double optic atrophy. In the light of these symptoms it was evident that some grave organic change was present. My friend, Dr. T. McKennan, who studied the case with me, believes that it is one of tabes. I am, however, disposed to regard the symptom-complex as one produced by gummatous syphilitic infiltration of the cord. Certainly, in the absence of ataxia and "lightning pains," it would be a very atypical case of tabes if we regard it as such.

Hysteria.—Turning now to hysteria, much is true of it which has been said of neurasthenia. It is almost unnecessary to state that it is always of utmost importance to distinguish between pure idiopathic hysteria and the hysterical symptoms which we so often find engrafted upon organic disease. Concerning hysteria, it is certainly true that hysterical states, particularly the unusual or bizarre ones, are often unrecognized. Thanks to the gifted French school, and particularly to the lamented Charcot and his pupil, Gilles de la Tourette, our knowledge of hysteria has been greatly enlarged and placed upon a more scientific basis. For instance, we know now that it occurs in males and in children much more commonly than was previously supposed. The old notion that it always arose from the womb is now well exploded. The study of the so-called stigmata of the interparoxysmal periods has, perhaps, more than anything else helped to place it upon a scientific basis. Under the new order of things hysteria is, unlike epilepsy and neurasthenia, to be regarded as a definite entity,—a psychical disease,—and I believe it is not too much to hope that the underlying pathologic changes will some day be discovered. I wish very much that this higher, better, more scientific conception of hysteria were more generally diffused among the profession than it appears to be.

When we consider that the emotions, anxiety, fear, worry, more frequently than any other cause provoke attacks of hysteria or hys-

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terical symptoms, it is not to be wondered at that symptoms of the disease appear after accidents or are engrafted upon various organic diseases; for are not these conditions well calculated to provoke the emotions named?

Let us, for example, suppose the case of a young mother suffering from an ovarian tumor. Who can imagine her emotions of fear, worry, anxiety, as she thinks constantly, as she almost necessarily must, of her dangers, her inability to perform the duties of mother and wife as she would wish, and probably of her operation day? Is it to be wondered at, especially if she possesses the temperament, that hysterical symptoms appear? This matter of temperament and heredity, of course, is a most important one. In the instance just supposed, it would determine whether the exciting cause just named would result in bringing out neurasthenic, hysterical, or other symptoms, or an admixture of several. The association of the symptoms of neurasthenia with those of hysteria is, I believe, quite common. Often I have been unable to determine which, if either, predominated. If the views which I have expressed concerning neurasthenia be accepted, then the same exciting causes might produce either or an admixture of both as determined by the temperament and heredity.

Given a case presenting hysterical symptoms, it always becomes our duty to determine whether it is one of pure hysteria or whether organic changes are present which give rise to the symptoms. To this end all known tests and methods of observation should be employed which can shed light upon the subject until the matter be, if possible, definitely decided. I have known physicians treating a case as one of organic trouble to change the diagnosis to hysteria upon the supervention of symptoms of that affection. Certainly one who recognized the comparative frequency of these hysterical concomitants in organic disease would not be apt to make this error. Very recently I was, in association with Dr. Larimer, of Allegheny, treating a woman whom we both believed to be suffering from brain syphilis, and who exhibited rather marked hysterical symptoms. These after a time disappeared, and her improvement under specific treatment has been very great. The simulation of organic disease by hysteria is sometimes very close and can be distinguished only with the greatest difficulty. On the other hand, it sometimes happens that hysterical symptoms are so closely engrafted upon organic disease that we will at times, in spite of our best efforts, be led into making a diagnosis of pure hysteria when serious organic disease is present. I recall a case of acute softening of the brain, which I have reported elsewhere in full,[1] in which hysterical symptoms were present in such a remarkable and unusual manner as to

[1] New York Medical Record, April 28, 1894.

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lead me and two other physicians to regard the case, for a time, as one of pure hysteria.

Many other nervous symptoms than those of epilepsy and neurasthenia might be cited as occurring in connection with organic diseases, but those I have touched upon are, perhaps, the most important.

It does not follow that when these symptoms are engrafted upon organic disease they are to be ignored in treatment. For while the therapeusis should, when practicable, be directed against the underlying structural change, yet at the same time these symptoms often require, and should receive, treatment directed to relieve them. Again, it very often, unfortunately, happens that no treatment is availing in removing or modifying the organic changes; then our chief and, perhaps, only efforts in therapeusis must be directed against the symptoms.

I cannot refrain from referring to grave errors which are often made of seizing upon insignificant, imaginary, or theoretical organic changes, and treating them alone on the supposition that all symptoms will disappear when they do. While the reflex sources of irritation in eye, ear, nose, throat, womb, etc., should be recognized, I do not believe in subjecting patients to annoyance of operation or local treatment, unless we have some definite data upon which to work. No one spoke stronger upon this subject than the late Professor Goodell, of Philadelphia, himself a surgeon. He frequently refused to operate on women sent to him for that purpose, essaying first to relieve them by measures directed to relieve the hysterical and neurasthenic symtoms.

While it was not my intention to touch upon the subject of treatment, I cannot refrain from referring, before I close, to one therapeutic measure which is available for all these nervous symptoms and is never contra-indicated in a single case. I refer to the psychical element in the physician himself. While it is never to take the place of our more exact measures of treatment, it always has its place. To be sure, most physicians do employ it, a good many of them unconsciously, however. Why should not each one of us endeavor to further develop and perfect himself in this direction, and use this tremendous, this heaven-given power for good in a more regular and systematic manner? It seems to me that he who sees in each patient simply a "case," a "disease," and fails to see and study and try to help the man himself, does not realize in its fulness the high vocation of the physician. Christian science, hypnotism, mind-cure, are merely exuberances, which have grown from and rest upon this great truth of mental influence. There are some physicians who little realize these great truths and yet have, so to speak, hypnotized themselves into always believing that when a patient exhibits improvement the last drug he has taken has effected the change, and who never for a moment think that the suggestion of

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a cure may have been wholly or partly responsible for the favorable change.

Now, while the value of making the distinctions I have spoken of can scarcely be over-estimated, we must, after all, treat the exact conditions present in each case, and we can always do so best when we study, know, and treat the patient who exhibits them.

A REMARKABLE PHENOMENON OF A LARGE RED-COLORED SCOTOMA.

By Richard A. Cleemann, M.D.,

Philadelphia.

The following curious experience was related before the Section on Ophthalmology of the College of Physicians of Philadelphia, December 18, 1894:

C., a physician, 53 years of age, on leaving at night a house situated on Rittenhouse Square, observed that each of the gas-lamps dotted over that broad space seemed to have a translucent crimson-red patch on the upper right-hand corner, and that the moon which was shining brightly appeared to have nearly a quarter of its disk obscured in the same manner. As he was conscious at the same time of a feeling of slight conjunctival irritation in his left eye, it occurred to him that the difficulty probably arose from that organ; he closed it and found his surmise correct, no patch being then visible. On reaching Spruce Street and looking westward towards the long vista of lamps extending to the river, the same red patch appeared to him in each lamp, and he noticed that the red spot seemed larger in each successive lamp, placed as they are about 200 feet apart, till in the last, about 500 yards distant, he saw but a narrow fringe of light to the left of and below the red area. The next morning his vision was as usual, though he still felt occasionally the slight irritation in the left eye; there was no headache at any time or other abnormal sensation. He awaited curiously the coming of darkness to learn if, looking on luminous objects, the red patch would again appear; but when night came he did not see it, nor has it been present again at any time during a year, which has now elapsed.

I have not found, in the several text-books on ophthalmology which I have consulted, any description of a condition exactly like the one above recorded. It differed from an *ocular spectrum*, in that there was no obvious antecedent cause, that it was observed only when the eye

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was directed upon a very brightly luminous object, was immovable, and disappeared entirely when the left eye was closed. In its fixedness and color it was unlike the *muscæ volitantes* of myodesopia, and was distinguished from the *constant scotomata* of that state by its transient nature and also by its red color. In colored vision, the *chrupsia* belongs to the whole visual field, while in this case only a part of that of the left eye was affected. *Phosphenes* may be colored, but they imply a sensation of light and are chiefly subjective phenomena, while this, needing a stimulus of light, was so far objective.

It was, I presume, more like the spots described in particular cases of *neuroretinitis* or *anesthesia of the retina*, which I believe may be colored, but it was only seen, as already mentioned, when the eye looked upon objects which were luminous in themselves or intensely reflective, like the moon, and did not persist when the eye was closed. *Scotomata for color* are, if I am rightly informed, seldom recognized by the subjects of these phenomena, yet it seems to me the appearance I have attempted to portray will fall among this class. I am aware that the *scotoma for red*—that is, when the eye is blind in a limited area to red—is the usual variety; yet there is no reason, theoretically, why, if the eye is thus blind to one of the fundamental colors (red) and sensitive to the others (yellow and blue,) it may not be blind to the latter two and sensitive to the former, thus giving a scotoma for yellow and blue, which would appear as a red spot. It is not difficult to imagine a partial anesthesia of a circumscribed portion of the retina, or of the nervous centre of vision, which would render it irresponsive to the narrower waves of blue and yellow light, while leaving it sensitive to the broader waves of red. This would be precisely analogous to those well-known cases in the domain of acoustics where shrill sounds are unperceived while the more grave are perfectly recognized.

What was the cause of C.'s pathological condition? He was otherwise in excellent health; he had suffered occasionally from slight manifestations of the uric acid diathesis but had never had any constitutional disease; he was of abstemious habits, rarely touching alcohol,—he had tasted none on the day in question,—and was a very moderate smoker of tobacco. Notwithstanding his 53 years he did not yet use eye-glasses, though he had been aware for some years that he did see to read quite as well as formerly. A careful examination of his eyes, kindly made recently by Dr. William F. Norris, discovered a certain degree of myopic astigmatism; otherwise the media and nerve structures of the organs as seen through the ophthalmoscope were normal.

Immediately before the experience which I have related C. had smoked a cigar more than usual and of a different brand, and while

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trying to decipher, though but for a short time, some badly-printed matter, had been conscious of discomfort in his left eye. In the absence of any more obvious cause, is it being too speculative to refer the scotoma to acute tobacco-poisoning complicated by eye-strain? In other words, to conceive that tobacco toxemia caused an irritable condition of the vaso-motor nerve-centres, under which the stimulus of the eye-strain produced a reflex contraction of the vessels of a limited area of the retina, with a resultant anemia and anesthesia in the affected space to all the waves of light but those of red? I think the eye-strain must be included in the etiology, because the phenomenon appeared in the eye presenting symptoms of that condition; and, as that alone appears insufficient, I have added tobacco-poisoning, which is known sometimes to produce scotomata for color. It is true that a great deal of tobacco had not been used. C. had only smoked two cigars in succession, and one perhaps earlier in the evening, but even this amount of tobacco may be looked upon as an excess for one whose habit was to smoke but one cigar daily. The difference in brand of the cigars also may have counted for something in the effect.

A FEW REMARKS ON RARE FORMS OF GOUT.[1]

By Dr. Debout d'Estrees,
Contrexéville, France.

On my recent arrival in Philadelphia, I was talking with my friend Dr. Tyson about the exceptions among gouty cases which I have met with in Contrexéville since the year 1868. Our colleague suggested to me that it would be of some interest for your society to hear a brief report about them. I will therefore endeavor to describe some of the most instructive.

Any of you, gentlemen, may have met in his practice with some cases never described before, of which the diagnosis is always very difficult, if not impossible; this was the case with me when in the year 1882 I met with the first example of gouty parotitis.

A gentleman, 63 years of age, who came every year at Contrexéville to obtain, as many of our countrymen, immunity from the evils of his future excesses, called me to Paris in consultation with Dr. Buequay, a member of the Academy of Medicine. He told us that after a long sitting the previous day at his dentist's, he was seized during the night with an intense pain in the region of the right parotid, which was hot, red, and swollen. No external application having

[1] Delivered before the Society for Clinical Research, Philadelphia, December 24, 1894.

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brought relief, I suspected in that case gouty interference. However, as I could not find anything in the most recent treatises on gout, and as my friends or masters, among whom I consulted Charcot, who wrote much about gout in former times, could not give me any information on the subject, I was obliged to agree with my colleague in the diagnosis of an abscess of dental origin, which would probably necessitate surgical interference; but when we visited the patient two days later the parotid was flat, and a regular fit of gout had invaded the left knee.

When I saw this gentleman again in July at Contrexéville, two months after the first consultation, he told me that gout invaded successively the left parotid and the right knee before leaving him. He felt well then, but complained of a very disagreeable salty taste in the mouth at the beginning of each meal. When in examining the patient I pressed upon the parotids, I at once excited the salty taste, which I could later demonstrate was produced by saliva loaded with urates, the epiphenomenon of the gouty attack.

I had, in July, 1887, another occasion to see a case of gouty parotitis, in a man of 54 years of age, having been called in consultation by one of my colleagues at Contrexéville. In this case the attack of the parotid was preceded by an attack in the wrist of the same side. As my colleagues had already used, without success, external applications, I did not hesitate to use internal remedies, and prescribed tincture of fresh flowers of colchium, fifty drops three times in twenty-four hours, and with each dose twenty-five centigrammes of sulphate of quinine. This treatment proved successful, as the patient was able, forty-eight hours later, to take the train to Paris, where he was urgently wanted.

I never saw other cases by myself, but I have collected a dozen, all unpublished, from Drs. Rotureau, Labadie-Lagrave, Boichox, Damaschino, and Goyard, in France, and Sir Alfred Garrod, Sir Dyce Duckmorth, Sir Oscar Clayton, and Stephen Paget, in England. I will not speak to you of the cases of gouty orchitis and gouty urethritis which I have met with. Either personally or by reading, you are already acquainted with the question. A case in which a crisis of gout began in the testicle, passed to the toe, and ended in the lung, I could present to you, but I would be afraid of abusing your kind hospitality and attention. I will only say that, in this only case of gout in the lung I saw, it was not, as in the cases described by Professor Potain, of Paris, in the apex or at the base that the gouty congestion took place, but in the central part, and it did not extend to more than six centimetres. Over and under this band of congested lung, the respiratory murmur was perfectly normal.

What must a practitioner do if he meets with such a case of gout out of the joints? I consider that in most cases, external applications

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being insufficient, he must use internal remedies, and I have already told you the one I prefer. After he has calmed the attack he must procure the elimination of the uric acid by the natural ways (such as is, as you well know, produced at Contrexéville by drinking the source du Tavillon), and induce him to adhere to a selected diet and strict hygiene, which in this country is difficult on account of business life, and in France, on account of the sedentary life and good living of our patients.

MEMORANDA.

SPINDLE-CELLED SARCOMA OF THE SOLE, CURED BY CHOPART, WITH DORSAL FLAP.

Among the parts of the human body where sarcomas develop, the foot and particularly the sole occupies an exceptional position by being extremely seldom the seat of these growths. In the available literature on this subject, I could find only one case, that of Von Eiselsberg, in which the sarcoma appeared primarily on the under side of the foot, and in its further development spread to the sole. But in the case under my care the seat of the tumor was confined entirely to the sole. Etiologically this new formation is probably to be classed with those first described in Esmarch's well-known report on "Malignant Tumors" as growing on a luetic soil.

Mrs. N. N., born in Denmark, aged 52 years, first consulted me on April 12, 1892, having been sent by Dr. Willy Meyer, of New York. She had been taken to the Skin and Cancer Hospital in that city with the diagnosis of tumor-recurrence on the sole of the left foot, and came in Dr. Meyer's ward. She had suffered for eight years with pain and a circumscribed swelling in that sole. Two years ago Dr. N. Rodgers, of San Francisco, removed the then existing growth for the first time. After a painless interval of one year she noticed a fresh swelling under the old scar left by the former operation, and with it the same pain returned. On her admission to the Skin and Cancer Hospital her pain had reached such a degree that she most urgently desired an amputation of the leg. As a result of his examination Dr. Meyer found, as he kindly informed me, unmistakable signs of lues, and, therefore, for the time being, refused an amputation or local operation. The patient was subjected to a strict antispecific treatment, and at the close of three weeks Dr. Meyer noticed that the tumor had shrunken to one-fourth

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its original size, and became very soft, almost semifluctuating. The pains in the mean time did not decrease, and unfamiliar surroundings and strange faces made her so homesick that she asked to be discharged from the hospital, and returned home. She was taken into the hospital here on the day after her arrival. She is small and very stout, and speaks with a slight nasal twang. With the exception of the usual children's complaints she was never seriously ill until eight years ago. A daughter, now married, is her only child, but she had several miscarriages. Her husband died of a disease, during the course of which sores covered nearly his entire body. She states that she never experienced pain or had an ulcer on her privates, and does not remember ever having had any red spots on her skin. She reports, however, having lost a piece of bone from the nose after prolonged suppuration in consequence of a fall, and has been treated in Boston and Washington for ulcers of the throat, which, according to the incomplete information of the somewhat obtuse patient, were also thought to be of luetic origin by the attending surgeons. Patient has a pronounced saddle nose, old scars on both the lateral and the posterior pharyngeal walls and on the soft palate; uvula is missing; larynx free. The thoracic and abdominal organs show normal conditions upon examination. On the outer half of the left sole appears a growth nearly the size of a hen's egg, which extends from about one and a half centimetres behind the talo-navicular joint to the metatarso-phalangeal line. Its projection had the size and form of a longitudinally-divided hen's egg, and gave a distinct impression of fluctuation to the touch. Along the centre extended the old scar of the operation in the stretched and thinned, but normally colored, skin. Even light pressure on the scar was extremely painful, especially on the anterior terminal point. The patient stated that the tumor was larger than before and the pains as bad as ever. Iodide of potassium and inunction treatment were tried energetically, but without result, the pains were getting rather worse than better. To dispel all doubts about the deceiving fluctuation, a puncture was made with a test-trocar under strictly aseptic precautions, and as nothing was discharged, the punctured opening was enlarged with the point of a tenotome. Only a few drops of blood escaped. In spite of an antiseptic occlusion-bandage, the small wound did not heal, a red, fungiform, easily bleeding mass proliferated from the opening. A small piece was obtained, and in the fresh state examined with the freezing microtome. In consequence of the microscopic diagnosis of spindle-celled sarcoma the removal of the foot above the diseased part was decided upon. The woman belonged to the laboring class, and could not wear a wooden leg. An artificial leg with its frequent expensive repairs did not conform to her means. The comparatively slight

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malignity of this formation, and the very slow growth of the tumor, strengthened the admissibility of the principle to preserve as much of the limb as possible.

The choice lay between Pirogoff and Chopart. With Pirogoff there was sufficient healthy skin on the heel to cover the stump, but the age and antecedents of the patient filled me with grave doubt as to the healing of the bone. Uninjured bones and a better base pointed to the Chopart operation, but I had to remove all the skin of the sole to the heel, and use a dorsal flap as a covering. I had no experience on the applicability of this method nor did I find any mention of it in literature. However, the experiment did not seem very daring, and I determined to make it.

Operation.—May 5, 1892. Chloroform narcosis, elevation of the limb, Esmarch tube. The incision for the dorsal flap began close behind the bases of the phalanges and was carried back close to the bone as far as the talo-navicular joint. Then, after the exarticulation of the

FIG. I.

Spindle-cell sarcoma.

anterior part of the foot in Chopart's line, the outcut being made back through the healthy part of the skin over the heel, and the arteries tied, the flap was drawn over and sewed to the skin in the sole. A short thin drainage-tube was fastened on each side at the suture of the flap; compression, occlusion bandage. The healing was disturbed by a few accidents, narrow marginal gangrene spread three or four millimetres along a third of the width of the dorsal flap, then formed a line of demarcation, and the gangrenous part sloughed off slowly. The temperature never arose above 100° F., pulse 96, after the first week it fell back to normal. The further progress of the healing was yet interrupted by an acute eczema of the skin on the back of the foot, which, however, was cured, after a few days, by a dry-powder treatment with oxide of zinc. As the wound cicatrized slowly the patient could not commence walking until the middle of July. On the left foot she wears a laced shoe, the front part of which is stuffed. Now, two and a half years

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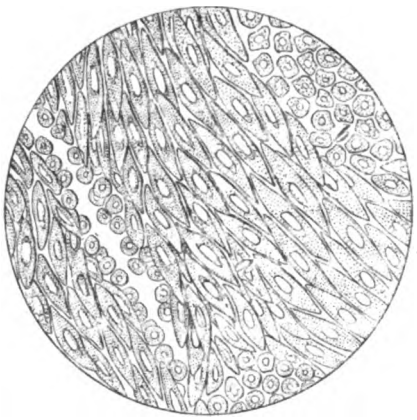
after the operation, she is not the least hindered in the use of her foot, nor does she suffer any pain. She occupies, since a period of already two years, a superintending position in the laundry of one of our largest hotels, where she is compelled to be on her feet the entire day. I have inserted here a recent photograph of the stump. The scar on the sole is not at all sensitive to pressure and is free from even macroscopically perceptible or palpable abnormal condition, the skin turned over from the back of the foot is slightly thickened and answers its purpose admirably. In the specimen the tumor had grown into the flexor brevis digitorum, the quadratus plantæ, and the interosseus secundum; they are embedded in its substance. The growth extends downward to the second and third metatarsal bones, the periosteum of which it has partially destroyed; of the second a place two and a half centimetres long

FIG. 2.



(*a*) Longitudinal section of spindle cells.
(*b*) Transverse section of spindle cells.

on the outer side only, but of the third the entire lower surface is bare and rough. The arteria plantaris externa was permeable, whilst those branches of the nervus plantaris situated between the two flexores digitori are lost in the mass of the tumor, a circumstance which probably accounts for the extraordinary severe pains.

About the first operation I could, unfortunately, ascertain very little. Dr. Rodgers remembered only that after the apparently complete removal of the growth the wound healed without difficulty. No microscopical examination had been made, and the patient had not been subjected to any specific treatment.

The tumor was now hardened in the ordinary manner and embedded in celloidin. The sections were colored, some with lithia-car-

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mine, some with hematoxyline. They show rows of closely-packed, spindle-formed cells where cut lengthwise, surrounded by others, cut crosswise, dissimulating round cells, everywhere one cell crowded closely to the other, with hardly any recognizable connective substance. In the accompanying cut *a* are the cells cut lengthwise, *b* the cross cut ones.

Although not fully three years have elapsed since the operation, I believe I may consider it a radical cure. Owing to the rarity of these tumors locating on the sole, it is hardly to be expected that the experience of this case, even in a very large surgical material, could be tested by a number of others. Communications, however, about the possibility of using the skin from the dorsum of the foot to walk upon might be very useful.

JULIUS ROSENSTIRN, M.D.

SAN FRANCISCO.

SYPHILIS IN THE INNOCENT.

THE following history shows a course of syphilis which, while probably very unusual, is at the same time often possible, and should emphasize the dangers which the innocent so frequently run.

The notes concern a family of Germans, father, mother, and several children, all being of the sturdy North German type.

The father is now 52 years old, and is employed in a brewery. He was for some nine years before his marriage an under officer in the German army, and has always been a strong, healthy man.

The mother has never had any serious illness. In spite of her large family and the fact that she has always been up on the second day after confinement, she is now, at 44 years, still menstruating and in the best of health.

Eleven years ago, while the mother was carrying child No. 9, to which I shall soon refer, a domestic was employed, with whom the husband became intimate only a few days before his wife's confinement. This woman was afterwards known to have had syphilis at the time she was in the house, and it is remembered that she had a sore mouth at that time. The older children were very fond of her, and she frequently kissed them, and gave them pieces of loaf sugar which she had previously bitten in two for them.

Shortly after this intimacy the husband had a sore penis, but no subsequent symptoms are known to have manifested themselves.

The wife had, in spite of repeated coitus, no symptoms for two or three months, when she developed a sore mouth with severe pains in the head. Some time afterwards she had a general skin eruption. She has never had other symptoms.

The children may be divided into two groups: (1) Those born

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subsequent to the parents', or at least the mother's, infection, and who had the indications of hereditary syphilis. (2) Those born previously, some of whom acquired the disease.

The first of the former group, the tenth child born to the couple, was a miscarriage at nearly six months.

No. 11.—A boy, died at 9 months and 2 weeks. Was always sickly. Mother says he had "holes in the roof of his mouth."

No. 12.—A boy, now 5 years old. Sickly as an infant. Had an eruption on the head, which, from the description, resembled favus. Has every year a painful ear with otorrhea. At 9 months of age he failed very much, becoming quite emaciated. Recovery from this was slow, but he is now strong and healthy. He has, however, an eruption every year upon the hands, which "looks like a burn, only it is black and the skin looks thicker than a burn."

No. 13.—Girl, now 4 years old. Had early an eruption on the head, which yielded to home treatment. Is now fat and well. Three miscarriages have followed this last child, due in each instance, however, to a definite cause.

Of the other group of nine children, four, Nos. 1, 2, 4, and 6 in the order of birth, never had symptoms of syphilis, and are therefore of no special interest. The history of the others is as follows:

No. 3.—A girl, now aged 20. Was healthy until 9 years old, the time it may be remarked when the servant was in the house, and the time of the initial symptoms in all the following cases. She then developed a very sore mouth and subsequently a skin eruption. Since that time she has been in good health.

No. 5.—Girl, now aged 16. Had a very sore mouth, but no eruption noticed. Now has two recurring sinuses on the right side which open yearly.

No. 7.—Girl, now aged 13. Sore mouth, full eruption, and some genital soreness. At 8 years of age had chorea.

No. 8.—Girl, aged 12. Sore mouth. Copious eruption, the entire body being covered. Has now a papillomatous condition in the nose.

No. 9.—Girl, born just before the mother's infection. Healthy when born. Sore mouth when 4 weeks old. No eruption noticed. At 2 years developed shortening and contraction of the left leg. There is now occasionally a reopening of a sinus upon the heel on that side.

It will be remembered that shortly after the birth of this child the mother noticed her own symptoms. When it is considered that the first of these was the sore mouth and that the general eruption did not follow for some time, it seems even possible that the mother may also have become infected through the mouth.

The history is a more or less remarkable one, and, while I am un-

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fortunately dependent for it entirely upon the mother's statement, it has been intelligently given more than once, and, upon cross-examination, remains unshaken in its entirety. A. H. CLEVELAND, M.D.,

Clinical Professor of Laryngology, Medico-Chirurgical College, etc.

A FURTHER NOTE UPON THE USE OF QUININE IN ENURESIS.

IN the *Therapeutic Gazette* for April, 1894, the writer advocated the use of quinine as a remedy for enuresis, and reported two cases successfully so treated after all the other more commonly-employed remedies had failed. The reasons which led to the employment of this remedy, as stated in the first paper, were that enuresis is due in most cases to a weakened or deficient inhibition exerted over the vesical centre in the cord, and, as quinine stimulates inhibition, it seems rational that it should be of value in this condition. This paper was followed by a communication to the California State Medical Association, made by Dr. F. F. Rowland, and published in the *Southern California Practitioner* for August, 1894, in which he supported this claim, and reported two cases successfully treated with this drug. Since this time the writer has so treated two more cases which he wishes to place on record.

CASE I.—A. K., female, aged 12 years, presented herself at the Dispensary for Nervous Diseases of the University Hospital, Philadelphia, on May 9, 1894, suffering from her fourth attack of chorea. In addition to this, she stated that she had suffered all her life from the habit of wetting the bed. Four grains of quinine three times a day were ordered. On the 14th of the same month she reported some improvement in the choreic movements, the enuresis being about the same. The quinine was then increased to four grains four times a day. May 31, she reported improvement of both symptoms. June 30, when last seen, there had been no return of either trouble.

CASE II.—N. B., aged 19 years, had been in the habit of wetting the bed since childhood, and for which she had been under treatment of various sorts without obtaining any relief. Four grains of quinine three times a day caused such a marked improvement in her condition that at the present time she has experienced no trouble of the sort for several weeks.

These few cases would seem to prove the marked value of quinine in the treatment of this disagreeable infirmity. The writer hopes that others will give it a trial and report the results obtained.

CHAS. S. POTTS, M.D.,

Instructor in Nervous Diseases, University of Pennsylvania; Assistant Neurologist to the University Hospital.

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ALUMNI NOTES.

The Growth of the University of Pennsylvania.

The extension of the medical course to four years has resulted in only a trifling reduction in the number of students. The following table shows the attendance of the Medical Department for the present session:

Third year	369
Second year	195
First year	242
Special	9
Total	815

A general summary of the officers and students of the entire institution shows a marked increase over the figures given in last year's catalogue. The officers of instruction, including the hospital service, number 273, while the students have reached a total of 2398, thus ranking Pennsylvania the third largest educational institution in this country. This growth in numbers has been steady and continuous, every department but one showing a net increase over the figures reported last year.

Dr. Donaldson Smith's Exploring Expedition.

News has been received from the expedition headed by Dr. Donaldson Smith (class of '89), which started in June last to make explorations in the regions of Lake Rudolph and Somaliland. Dr. Smith has sent a letter, under date of December 14, in which he says that the expedition has made considerable progress, and that Dodson and Gillett, his two associates, have travelled over a large area of country that has never before been explored. Dr. Smith and his companions endeavored to reach the Great Lakes, but were prevented from doing so by the Abyssinians, who compelled them to turn back.

Color-Blindness in Asiatics.

Among the publications of the German Asiatic Society of Tokio, Japan, for 1894, is a paper by Franklin B. Stephenson, M.D., Surgeon U. S. Navy, entitled "Color-Blindness in Asiatics," giving the results of observations on the natives of Hawaii, Unalaska (Aleutian Islands), Japan, China, Anam, Siam, including the various nationalities from Borneo and India who live in Singapore and other portions of the Peninsula of Malacca. It appears that no people is free from this defect in perception of color.

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The Annual Banquet of the Penn Club, of Delaware, at Wilmington.

The annual banquet of the Penn Club, of Delaware, composed of graduates of the University of Pennsylvania, was held on February 6, at Wilmington. The room was handsomely decorated with the college colors, and portraits of the late Dr. D. Hayes Agnew and other prominent University men adorned the walls. Dr. James A. Draper was toast-master, and the following toasts were responded to: "The University," Provost Harrison; "The College Department," Professor Fullerton; "The Law Department," Dean C. Stuart Patterson; "The Department of Medicine," Dr. E. W. Holmes; "The Department of Music," Professor H. A. Clarke; "The University and its Clubs," Mr. Alfred Lee.

Appointment.

At a meeting of the Board of Charities and Correction, held on February 12, 1895, the vacancy in the position of Registrar of the Obstetrical Staff was filled by the appointment of Dr. Harry Toulmin.

Necrology.

Dr. Samuel K. Ashton died on February 11, 1895, after a week's illness of pneumonia. He was born in Philadelphia, April 6, 1822, and was educated at Haddington College, Germantown Academy, and the University of Pennsylvania, graduating from the last-named institution in 1841, and in medicine in 1843. Dr. Ashton practised his profession for a number of years, when he retired for a period of twenty-five years, but resumed practice about 1882, and actively continued it until the beginning of his fatal illness. He leaves nine children, two of whom, Thomas G. and W. Easterly Ashton, are also physicians. He was a life-member of the Historical Society of Pennsylvania, and also of the American Philosophical Society, and a member of a number of other scientific bodies.

Dr. George A. Rex died suddenly on February 5, 1895. He was born at Chestnut Hill, Pa., and at the time of his death was in his 50th year. He was a graduate of the University of Pennsylvania (class of 1868), and during his earlier life was assistant demonstrator of anatomy in that institution. During the Civil War he was an engineer in the United States Navy. He was a member of the College of Physicians of Philadelphia, and of the Academy of Natural Sciences. He practised medicine for twenty-five years, and was highly esteemed by the profession and the community.

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EDITORIAL.

SUBPHRENIC ABSCESS.

THE term subphrenic abscess has been applied to those circumscribed collections of pus usually situated either in the right hypochondrium, between the convex surface of the liver and the diaphragm, or between the diaphragm above and the spleen and stomach below. The name pyo-pneumothorax subphrenicus was devised by Leyden to designate circumscribed collections of gas and pus below the diaphragm, but the name is a faulty one, since it indicates a condition which does not exist, but which is simply simulated,—namely, pneumothorax. Perhaps a more correct term for the affection would be pyo-pneumo-subthorax.

Prior to 1880, when Leyden published his celebrated paper on the subject, the condition was seldom recognized clinically; as a result the reports of cases before that date are meagre and incomplete. Of the 170 cases recorded in literature, the cause was absolutely unknown in twenty-eight. There remain, therefore, 142 cases upon which our knowledge of the etiology of the affection can be based. In view of the frequency with which subphrenic abscess perforates the diaphragm and excites a secondary pyothorax or pneumonia, it seems somewhat curious that in only eight instances was the exciting cause of the peritoneal suppuration situated on the thoracic side of the diaphragm. Empyemata rarely produce subphrenic abscess; when not artificially drained they usually vacuate through a bronchus or the thoracic walls, or if they perforate the diaphragm at all, the process is an abrupt one and is speedily followed by general peritonitis and death. There seem to be but three instances in which pyothorax was the exciting cause of subphrenic abscess, and in one of these the etiology was doubtful.

Pneumonia is another rare cause of subphrenic abscess. Meltzer (*International klinische Rundschau*, No. 29, 1893) reports the case of a child, aged 26 months, with pneumonia of the right lower lobe which terminated in an abscess below the diaphragm. He thinks the cause of this condition was infection through the lymph-vessels of the diaphragm. According to the author only two of such cases have ever been described. One case of phthisis, reported by Andral, seems to have been the cause of localized subdiaphragmatic suppuration. In

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this case the collection of pus situated between the stomach and spleen was found to be in direct communication with a tuberculous cavity located in the base of the left lung. Doubtless, the natural direction of the lymph-flow from below upward through the diaphragm is the cause of the inflammatory process below the diaphragm, more commonly invading the thorax, than diseases of the latter cavity extending to the peritoneum.

By far the most frequent abdominal affection which excites local suppuration below the diaphragm is gastric ulcer. Eighty, or more than 50 per cent., of the recorded cases in which the cause was apparent resulted from this disease. Lee Dickinson (*British Medical Journal*, February 3, 1894) states that with the view of comparing the frequency of general peritonitis and limited peritoneal suppuration as resulting from simple gastric ulcer, he has examined the post-mortem records of St. George's Hospital, which extend over a period of fifty years. These records contain twenty-five examples of perforation of simple gastric ulcer into the general peritoneal cavity without any, or with but a slight, attempt at limitation, and twenty-three examples of more or less completely circumscribed peritoneal suppuration from gastric ulceration. Another point brought out in the paper is that in a large proportion, about 50 per cent., of the cases of gastric perforation, no matter in what part of the stomach the rupture may be, the extravasation and peritonitis are limited at first. "In most cases," writes the author, "when general peritonitis is found at the post-mortem examination the inflammation is most intense in the subphrenic region, perhaps the more solid of the extravasated gastric contents remaining here in a cavity half closed by adhesions; while sometimes the extravasation has clearly taken place into a cavity so circumscribed that the peritonitis became generalized merely by the rupture of an adhesion some days after the perforation. In fact, there are all degrees of transition between a perfectly unlimited peritonitis and a typical subphrenic pyo-pneumothorax."

The occurrence of subphrenic abscess does not seem to be much influenced by the location of the ulcer in the stomach. It is true that in ten out of twenty-three cases, reported by Dickinson, the ulcer was located on the anterior wall of the stomach, but the significance of this proportion is materially lessened by the reflection that ulcers situated anteriorly, though far less frequent in occurrence, are much more apt to perforate than those on the lesser curvature or posterior wall. Hence, it is not surprising to find such a large proportion of anterior ulcers associated with localized suppuration.

About 6 per cent. of the cases of subphrenic abscess resulted from the perforation of a duodenal ulcer. In one instance the ulcer followed soon after an extensive superficial burn.

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Next to gastric ulcer the most frequent cause of circumscribed suppuration below the diaphragm has been appendicitis. In about 10 per cent. of the recorded cases the starting-point was the appendix. In several instances the pus pierced the diaphragm and found exit through a bronchus, the primary lesion in the appendix subsequently healing. When perforative appendicitis is the cause of the abscess the cavity generally contains air as well as pus. In view of the zeal with which early operative interference in appendicitis is being advocated at the present time, it is probable in the future perforation of the appendix will become a rare cause of subphrenic suppuration.

Gastric cancer is only an occasional case of pyo-pneumothorax. It seems to have been the cause assigned in six of the recorded cases. Gastric cancers rarely perforate; according to Brinton only 4 per cent. do so, and when they do, the intestines are not infrequently involved. That traumatism is capable of producing the variety of abscess under consideration seems evident from the fact that it sometimes developed soon after an injury, and where a subsequent post-mortem examination failed to reveal any initial lesion of the abdominal or thoracic viscera. Fagge (*Guy's Hospital Reports*, Vol. XIX, 1874), in his collection of sixteen cases of subphrenic abscess, mentions several examples in which the apparent cause was traumatism.

Hepatic abscesses in the majority of cases do not rupture; unless operative interference is instituted, they generally kill before extension occurs beyond the boundaries of the liver. In 508 cases of hepatic abscess reported by Rouis, Cambay, Andral, Haspal, and Waring, death occurred before rupture in 300 instances. Spontaneous evacuation through the lung, pleura, intestine, or abdominal parietes is far more frequent than rupture into the peritoneal cavity. When the latter does occur, death, as a rule, speedily follows from extensive peritonitis. Abscesses near the convex surface of the liver, when they open at all, usually open directly into the pleura or lung, and only rarely between the diaphragm and liver.

Lesions of the spleen occasionally excite subdiaphragmatic abscess. Rupture of the organ from traumatism is the most common cause of the perisplenic suppuration, but occasionally metastatic abscess or infarction is the primary affection.

Purulent accumulations in the lesser peritoneum are occasionally connected with some disease of the pancreas, such as abscess, acute inflammation, cysts, or fat necrosis. Such cases have been reported by Lloyd, Whitton, and Musser. The development of large cysts containing dark-red fluid, rich in albumen, and an amylolytic ferment, however, seems a more common result of injury to the pancreas than abscess.

Suppurative disease of the kidney is not an uncommon cause of

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subphrenic abscess,—calculous pyelitis or renal tubercle may produce a perirenal suppuration which, in turn, may extend to the diaphragm, lead to perforation, and the development of purulent pleurisy or pneumonia. Bowditch, J. William White, Lafavrell, and Mason have each recorded cases of purulent accumulation beneath the diaphragm secondary to renal calculus.

Among rare causes of subphrenic abscess may be mentioned enterocolitis, dysentery, typhoid fever, and hydatid disease of the liver.

The symptoms of purulent effusions below the diaphragm vary considerably, and depend measurably upon the primary or causal disease. If we consider those cases in which the abscess has resulted from rupture of the stomach, duodenum, or vermiform appendix,—and these are by far the most common,—we find that, as a rule, the onset is rather abrupt. Perhaps the most constant symptom is pain; this is often very severe, and frequently resembles the intense colic of intestinal obstruction. Vomiting is another prominent symptom; it is particularly marked when perforation of a gastric ulcer has excited the abscess, but it is frequently present to some extent even when the primary lesion is outside of the stomach. The vomited matters may be bilious and streaked with blood. Dyspnea is rarely absent, and the breathing is usually costal in type. The difficult breathing may be due to this elevated position of the diaphragm, or to a secondary inflammation of the thoracic viscera. The constitutional phenomena of suppuration—irregular fever, sweats, and chills—are generally noted, but in not a few instances they were entirely wanting, probably from the perfect encapsulation of the pus.

There is apt to be more or less cough. It is generally dry, but in those cases where a fistulous communication has been established between the abscess and the lung, it may be attended with copious purulent expectoration.

The physical signs of subphrenic abscess are often very misleading. Inspection commonly reveals a swelling in the abdomen just below the diaphragm. The protrusion is generally less marked when the abscess is on the left side than when on the right, between the liver and diaphragm, for in the latter group of cases the downward displacement of the liver materially adds to the abdominal enlargement. Palpation over the swelling rarely detects fluctuation. When the collection is purely liquid, percussion yields dulness, extending from the epigastrium or left or right hypochondriac region upward, generally on one side only, sometimes anteriorly as far as the nipple, or, more commonly, posteriorly within a short distance of the scapular spine. Frequently when the exciting cause has been rupture of the stomach, duodenum, or appendix, the lesser peritoneum contains air as well as pus; and in these

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cases the dulness may be replaced by a tympanitic note, the condition simulating closely a pyo-pneumothorax. The replacement of dulness in the epigastrium, after a day or two, by tympany is very significant. When the primary lesion is in the stomach, the physical signs are generally most marked on the left side. In at least 75 per cent. of all cases resulting from the perforation of a gastric ulcer, the effusion is on the left side between the diaphragm above, and the spleen, stomach, and left lobe of the liver below. Duodenal and appendicial ulcerations nearly always produce effusions on the right side of the abdomen. Palpation of the thoracic cases usually reveals diminished fremitus over the dull or tympanitic area. Auscultation over the affected side reveals a normal vesicular murmur above and feeble breathing below. In cases of pyo-pneumothorax subphrenicus metallic or amphoric sounds may be detected over the tympanitic area.

The difficulty in diagnosing subphrenic abscess is much increased by the presence of secondary thoracic inflammation. In the majority of cases, empyema, pericarditis, or pneumonia complicates the condition. In twenty-four cases of circumscribed peritoneal suppuration resulting from the perforation of gastric ulcer, reported by Lee Dickinson, thoracic complications were present in seventeen instances. The most common complication is empyema of the pleural sac immediately above the abdominal effusion.

The diagnosis of pyo-pneumothorax subphrenicus from pneumothorax is generally attended with difficulty. The following indications laid down by Leyden in his original article, though often useful, are not altogether reliable:

(1) The sequence of events: The history of abdominal symptoms prior to the development of the supposed thoracic disease.

(2) The development of an exudate in the lower part of the thorax with febrile symptoms, and the non-appearance of cough and sputa.

(3) In pneumothorax the respiratory murmur is usually normal under the clavicle, and the line between normal and abnormal sounds is an abrupt one.

(4) In subphrenic abscess the ribs show little bulging, and the heart is but little displaced. It is well to observe that this is valuable only when the abscess is unassociated with pleural effusion.

Another point suggested by Mason is that the lung often adheres to the diaphragm and parietes, so that, although there may be a diminution in the breath-sounds and fremitus, they are not entirely abolished as in general pneumothorax.

Scheurlen regards the detection of the friction sounds of dry pleurisy near the diaphragm as a valuable aid in the diagnosis of subphrenic abscess, and also observes that the semilunar space on the

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left side, which is rarely absent in pleurisy, save in very large effusions, is commonly wanting in effusions beneath the diaphragm. The withdrawal of serum from one interspace and of pus from another level is regarded as a valuable sign, and was confirmed in a case reported by Mason. In those right-sided effusions, between the liver and diaphragm, which simulate empyema, the marked downward displacement of the liver dulness is quite suggestive of subphrenic abscess.

The cysts resulting from injury to the pancreas very closely resemble subdiaphragmatic abscess, but they are more frequently fluctuating, rarely associated with fever, and on aspiration yield a dark red fluid, rich in alkali, albuminate, and digestive ferments.

Purulent collections in the lesser peritoneum, if left untreated, may eventuate in one of several ways.

(1) They may kill through septicemia, this being a common termination.

(2) They may rupture into the general peritoneum, and excite a fatal peritonitis.

(3) They may prove fatal by inducing empyema, pneumonia, or pericarditis.

(4) They may evacuate themselves spontaneously through the lung, parietes, or bowel, and so effect a cure, the original perforation having entirely healed. Such cases have been reported by Leyden and others.

The prognosis of subphrenic abscess is always extremely grave; it depends considerably on the primary cause, and on the time which has elapsed between rupture of the viscus and the institution of treatment. Of the recorded cases about 20 per cent. recovered. The prognosis is far more favorable in abscesses resulting from appendicitis, renal disease, or hepatic suppuration than in those due to the rupture of a gastric or duodenal ulcer.

Doubtless in the future early recognition, and the prompt institution of surgical treatment, will materially lessen the mortality of these cases. As regards the treatment of subphrenic abscess, there is very little to add. Spontaneous cure is so rare that the only hope of treatment lies in free incision, irrigation, and drainage. In gastric and duodenal ulcer an attempt, though it will rarely be successful, should be made to close the perforation. Of twenty-seven instances of operation for the treatment of perforated gastric ulcer collected by Gilford (*Lancet*, June 2, 1894) six recovered. The only instance of recovery following laparotomy for the relief of perforating gastric ulcer with subphrenic pneumothorax which we are able to find is recorded by Ewart and Bennett in *The Lancet* for November 17, 1894. In this case operation was performed one week after the appearance of the abscess, and, although a secondary empyema developed which required aspiration, the patient made a speedy recovery.

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DR. WILLIAM PEPPER'S FINAL REPORT.

DR. WILLIAM PEPPER has recently submitted to the Board of Trustees of the University of Pennsylvania his report for the period from October, 1892, to June, 1894. This is Dr. Pepper's final report, and is especially interesting in showing the wonderful progress which the University has made in little over a decade. Tabular statments have been introduced in which comparisons are made between the institution as it was in 1881, when the ex-provost's administration began, and in 1894, when it came to a close. Thus,—

	1881	1894
Land	15 acres	52 acres
Number of students	981	2180
Fees of students	$92,701	$230,567

In the period alluded to the following departments were created: The Wharton School of Finance and Economy, the Veterinary School and Hospital, the Biological School, the Department of Philosophy (graduate), the Department for Women, the Department of Physical Education, the Department of Archeology, and the Laboratories of Hygiene and Chemistry. In addition to these new departments, a number of independent organizations have been brought into intimate relation with University teaching,—namely, the Lecture Association, the Archeological Association, the Wistar Institute of Anatomy, and the American Society for University Extension. The curricula of the various schools have been extended and improved, the medical course has been lengthened to four years, and the dental and law courses each to three years. The demand for increased clinical facilities has resulted in the following additions to the University Hospital: The Training School for Nurses, the Maternity Hospital, the D. Hayes Agnew Memorial Wing, and the William Pepper Laboratory of Clinical Medicine.

That portion of the report dealing with the subject of college athletics will doubtless be read with great interest. Upon this subject Dr. Pepper says,—

"It is obvious that there are grave risks connected with these sports, risks of bodily injury to the participants, especially in the more violent games, such as foot-ball; risks of interference with important studies, owing to the excessive claims of the practice and training required, or to the unduly frequent absences incident to the numerous matches; risks of loss of tone and character from the spirit of professionalism or of unfairness, which partisan zeal may admit, or from bad surroundings encountered at some of the more exciting games. These risks must be admitted and recognized. Yet I am forced to state, after

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careful and prolonged observation, that the net results of inter-collegiate athletic sports seem to be enormously on the side of the good, and of good scarcely attainable in other ways, while the evils attendant seem capable of great amelioration by proper systems of restraint and supervision. The rules which should govern each sport can be fixed only by conferences of experienced and high toned players.

"The extent to which students may be permitted to engage in such contests requires the judgment of the Director of the Department of Physical Education and of the several professors who are familiar with the students concerned. The exclusion of professionalism and unsportsmanlike practices and the restriction of the temptation incident to certain contests demand the enactment and the rigid enforcement of adequate rules.

"The details of these questions are numerous and at times complicated; they cannot be discussed to advantage in a general way. If the authorities of each institution are in earnest in promoting the good and eliminating the evils of inter-collegiate athletic sports, I have such rooted confidence in the good tone of American students as a body as to make me assured that satisfactory results will be attained.

"The action taken by your Board in February, 1894, was to establish, and provide with adequate authority, a committee consisting of representatives of each Faculty and of the Athletic Association. The composition of the committee insured the immediate acceptance of its authority and fairness. The set of rules adopted by them and promptly enforced throughout the University exerted an obviously happy effect, and has received widespread approval.

"They seem likely to deal effectively with abuses, and to insure a strictly honest representation in all contests, a proper attention to the physical fitness of the contestants, and a sufficiently good record in scholarship to justify the expenditure of time involved. They certainly make it clear that this University will retain no student upon its rolls whose only title to such a place is his powers on the athletic field."

The report forcibly presents the claims of the University to be considered as the organ of the State for higher education, and strongly appeals to the legislature for a liberal appropriation with which to carry on the work of post-graduate instruction.

When we consider that the University has not received a cent from the State for educational purposes for forty-two years, and despite this that it has forged ahead until it now occupies a foremost place among the collegiate institutions of the country, the sum of $500,000, which the State is asked to appropriate, seems indeed a paltry one.

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MEDICINE.

UNDER THE CHARGE OF

WILLIAM PEPPER, M.D., LL.D., AND JAMES TYSON, M.D.,

ASSISTED BY

M. HOWARD FUSSELL, M.D.

FUNCTIONAL DISEASES OF THE HEART.

POWELL (*British Medical Journal*, November 10, 1894) describes a functional disease as one where the heart itself is normal, but there is a perverted action of the organ. The first condition is an undue perception of the heart's action, whether normal or altered; this he believes to be a central neurosis usually hereditary, which has either mental shock or nervous shock as the exciting cause; the rhythm of the heart is variable, with variable tension. Such cases are best treated by not ignoring the trouble, but persuading the patients to make the best of their unfortunate inheritance, insisting on fresh air, physical and mental exercise, short of fatigue, and avoidance of drugs. Oppressed action of the heart is accompanied by the symptoms of increased arterial tension, headache, tension over the brow, and cardiac distress. The peculiar weariness is referred to the apex; sometimes there is a fluttering feeling. It occurs in males. They rise late, hurry through breakfast, hurry through business, return fatigued, eat dinner, and retire. Some of these cases have attacks of cardiac palpitation and distress which approach true angina pectoris.

Many cases of true angina pectoris belong to the functional group. In these vaso-motor excitation causes embarrassment of a heart which is structurally diseased.

In a certain group the heart's action is accelerated; among these are the ordinary cases of palpitation due to sudden emotion or exertion, as in athletes, or in a person in sudden danger. These cases are purely physiological. The rhythm is regular. In another class there is a diseased heart and irregularity of action, brought about frequently by disordered digestion. Direct irritation of the cardiac nerves by endocarditis or pericarditis will often cause irregular action. Overstrain is also another cause of such disturbance.

Sustained hurry of the heart or tachycardia he believes to be of truly nervous origin, and the heart-changes to be secondary.

Slow pulse, slow irregular pulse, and slow pulse with intermediate heart-beats are all occasionally met with.

An abnormally slow pulse is occasionally met with as a sequel of diphtheria, influenza, and typhoid. These cases, probably, are due to a neuritis of the cardiac branches, and to an inhibitory action on the cardiac muscle by the over-acid blood.

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Preparation of Behring's Antitoxin.

Klein (*Lancet*, December 15, 1894) gives a plan of the treatment of the horse in the preparation of antitoxin serum which he considers much superior to that published by Roux. The serum becomes antitoxic much more quickly than by Roux's method.

The method is as follows: A few injections of attenuated diphtheria bacilli (the attenuation is due to the age of the culture) along with their toxin are made, and the horse is thus furnished with a considerable degree of resistance. Next, large quantities of living diphtheria bacilli (*minus* their toxin) taken from the surface of solid cultures of gradually-increasing virulence, are repeatedly injected subcutaneously, so as to allow the bacilli to grow and to multiply, and to produce within the body of the animal the toxin and ultimately the antitoxin. Every such injection is followed by a temporary rise of temperature, varying from .6° to 1.8° C., and a local tumor, but there is no suppuration at the seat of inoculation. As soon as the tumor has disappeared a new injection is made. By the third week the animal will bear the injection of the scraping of the surface of two large agar cultures of virulent character. In one horse he obtained antitoxic serum after this method in twenty-three days after the first injection, in another in twenty-six days. It was found that one grain of this serum was capable of protecting 20,000 to 40,000 grammes body weight of guinea-pigs against living bacilli and toxin. The serum has been used in cases of human diphtheria with highly satisfactory results. The dose was five cubic centimetres to ten cubic centimetres, and in severe cases was repeated after twenty-four hours.

Diagnosis and Antitoxin Treatment of Diphtheria.

Woodhead (*Lancet*, December 15, 1894). In this article the writer gives the mortality of diphtheria in the Metropolitan Asylums Board's Hospitals as 46.4 per cent. in 1888, which has gradually decreased up to the present time to 30.3 per cent., which agrees well with the statistics of this country, but is much less than the mortality in Paris and Berlin hospitals, abstracts of which have been published in this journal. In the Continental hospitals, where serum therapy has been most largely tried, the percentage has dropped to almost or quite one-half. His views on the etiology and bacteriological diagnosis of the disease agree perfectly with the results lately published under the auspices of the Board of Health of New York, which have also been lately abstracted in this journal. He thus sums up the advantages of a bacteriological examination of all cases of sore throat.

(*a*) It will help to decide the nature of certain obscure cases of sore throat.

(*b*) It will definitely prevent the diagnosis of cases of sore throat not contagious as true diphtheria, and will thus prevent the spread of the disease, and also alarm of those who suffer from ordinary sore throat who think they have diphtheria.

(*c*) It will enable the physician to determine when a case of diphtheria can safely resume its place in society.

As the results of serum therapy we have direct clinical results which show that in a large proportion of cases the use of antitoxin acts almost as a charm. The temperature falls suddenly, and the formation of false membrane appears to be checked almost immediately. It is also claimed that the sequelæ of diphtheria are neither so grave nor so common where antitoxin has been used.

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Bovine Tuberculosis.

This subject was discussed by the following gentlemen before the Massachusetts Veterinary Association, May 23, 1894, from the stand-point of the veterinarian.

Peters (Prevalence of Bovine Tuberculosis) found that the mere physical examination of cattle often allowed cases to be overlooked, while by the use of tuberculin it could be certainly diagnosed, at least three times as many cases being found by this method. He believes the disease is much less common among calves than among adults, and less common in steers than in cows. He believes that cows frequently get the disease from persons who attend them, and who are affected with the disease.

Winchester (Diagnosis and Prevention of Bovine Tuberculosis) considers differential diagnosis of tuberculosis of the udder to be most important. When simple mastitis is present there is a diffuse swelling of the part affected, which is hot and painful to the touch. When it is tuberculous the swelling is hard and nodular, and feels as though it were full of kernels or seeds. The only certain way in which a diagnosis of tuberculosis can be made is by the use of tuberculin, which should always be used by a trained veterinarian. The requirements for protection can be summed up in the word hygiene. Sunlight combined with good air and drainage is necessary to protect animals against the disease. All animals used for procuring vaccine should first be subjected to the tuberculin test.

Infantile Scurvy.

Barlow (*British Medical Journal*, November 10, 1894) thus describes this interesting and apparently increasing disease. The symptoms begin rather suddenly and begin at any period after four months, but most commonly between nine and eighteen months. The child is generally rickety, but fairly fat. There is a certain amount of pallor. Suddenly the child becomes fretful. The lower limbs are flexed and still, but when placed in the bath or otherwise moved it becomes plain that the pain is connected with the lower limbs. The upper limbs, at this period, may be touched with impunity, but any attempt to move the legs or thighs gives rise to screams. Next, obscure swelling may be noticed, first on one lower limb, then on the other. The swelling is suggestive of thickening of the shafts of the bones, beginning at the epiphyseal junctions. Slight edema now occurs, there is never fluctuation. Gradually the bulk of the limbs affected becomes increased. About this time the position of the limbs becomes changed, they lie everted and immobile. The knee-jerks and plantar reflexes may be obtained. The back now becomes weak, and swelling of the scapulæ may be observed and the upper limbs begin to change. The joints are free. Fractures occur at the epiphyseal junctions. At this period the sternum with the costal cartilages seems to have sunk back *en bloc*, as though it had been subjected to some violence which had driven it back. There develops a sudden proptosis beginning in one eye and later affecting the other. The most profound anemia accompanies this limb-involvement. Emaciation is not marked. There is slight fever as new limbs are involved, but it never rises above 102° F. The condition of the gums bears a definite relation to the number of teeth. If several teeth have appeared considerable sponginess with fleshy swelling forms. If but a few teeth are present there is slight sponginess. If no teeth have appeared the gums may be normal, or small extravasations may be seen over the sites of the oncoming teeth.

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When uninfluenced by treatment the disease runs a course of three or four months. By slow degrees the swellings subside and an osseous sheath forms about the bone. By degrees mobility returns and the child begins to raise itself.

Post-mortems show that the chief lesions are subperiosteal hemorrhages with their secondary consequences. The visceral changes are not important. The author believes this condition to be neither rickets nor syphilis, but certainly belongs to scurvy.

It occurs in children who have been fed exclusively on condensed milk, on very highly diluted cow's milk sterilized, or on artificial foods. In no case was the child breast-fed. The disease may be cured when present by giving the child fresh vegetables, notably potatoes and meat-juice or gravy, together with a tablespoonful of orange-juice or lemon-juice daily. The disease occurs rather among well-to-do than among poor, because they can afford to buy artificial foods, while the poor give food which may cause digestive troubles, but prevents scurvy.

Pyrexia and its Treatment.

Hale White (*British Medical Journal*, November 17, 1894), in an exhaustive article on the above subject, makes the following points: An animal is said to be suffering from pyrexia when its temperature exceeds the highest point of its healthy range. The chief seat of heat-production is in the muscles. The thermogenetic function of muscle is under the control of the corpus striatum, from which impulses are constantly proceeding by means of the crura, pons, cord, and nerves. Most of the loss of heat takes place from the skin by radiation and evaporation. Experimental damage to the cortex is often followed by considerable pyrexia.

Clinical Pyrexia. Cortex.—(*a*) Traumatic damage, such as hemorrhages or blows to the head, often causes rise of temperature, and frequently there is a greater rise on the opposite side of the body than on the injured side.

(*b*) Meningitis may be accompanied by a high, low, or irregular temperature, and this is supposed to be due to interference with the cortex.

(*c*) Epilepsy is frequently accompanied by high temperature after the fit.

(*d*) Hysterical pyrexia occurs oftenest in women, but one should be careful not to mistake a case of organic lesion for hysteria; it may be different in different parts of the body, the effect of antipyretics is uncertain.

(*e*) In delirium tremens there is usually a rise of temperature.

Corpus striatum.—(*a*) Hemorrhage: if only one corpus is affected, the temperature is highest on the opposite side of the body; for the first few hours there will be a fall of temperature, followed gradually by a rise, which is again followed by subnormal temperature before the normal point is reached. A case of softening of the corpus is recorded where the temperature rose to 107° F. Diseases of the cord and pons are often accompanied by a rise of temperature. Reflex pyrexia occurs, as proved by the rise of temperature after simple fracture, biliary colic, burns, etc.

Some substances cause pyrexia by their circulation in the blood through the thermic apparatus, notably atropine, strychnine, cocaine, and caffeine, but the most important are the toxines produced by the micro-organisms of specific fevers.

Treatment.—(*a*) *Hyperpyrexia* is a rise of temperature, which in itself is a threat to the life of the patient. In the majority of cases a temperature of 106° F. is hyperpyrexial; 84 per cent. of such cases are fatal. In many cases all treatment is hopeless, but in all cases cold must be applied. In nearly all cases a cold

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bath of 70° to 75° F. must be used. The usual length of immersion is ten minutes. No dependence can be placed in antipyretics.

(*b*) *Pyrexia.*—It is thought by some that pyrexia is beneficial. A mere reduction of pyrexia may give a false idea of security. Lowering the temperature may impair the immunity against a second attack of a specific fever. Acetanilide and other antipyretics given as a routine practice are harmful, and the practice is unscientific. Cold-water treatment of typhoid fever undoubtedly lowers the mortality, but mild cases do not require it; it probably does good not alone by reducing the temperature, but it doubtless eliminates much of the toxic principle developed during the disease.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

ASSISTED BY

G. G. DAVIS, M.D., M.R.C.S., AND ELLWOOD R. KIRBY, M.D.

TRIKRESOL.

CHARTERIS (*Lancet*, March 31, 1894), as the results of experiments with this substance, states that it is soluble in water to the extent of 2.2 to 2.55 per cent. On micro-organisms it is almost, but not quite, three times as powerful as pure phenol. An exposure of the staphylococcus pyogenes aureus to 1-20 phenol invariably rendered the organisms sterile in two minutes, and 1-60 trikresol had the same effect, but in the shorter exposures the one in twenty phenol gave a greater proportion of sterile cultures. Trikresol is also three times less toxic than phenol.

STRICTURE OF THE ESOPHAGUS.

MAYO (*New York Medical Journal*, 1894, p. 433) gives the history of a child, aged 3 years, suffering with stricture of the esophagus. Gastrostomy was performed, and, after healing, a search made for the cardiac orifice with the little finger. This caused gastric disturbance and leakage, and a month later an esophagotomy low down was performed. A probe was then passed up through the stomach and out of the wound in the neck. By means of this probe a heavy double strand of braided silk was drawn through the channel. The stricture was about three-quarters of an inch in length. One strand of the silk was used to cut the tissues after the method of Abbe, while knots were tied on the second strand and pulled into the obstruction to keep the stricture tense. By these means the opening was greatly enlarged. The cutting of the edge of the gastric fistula was obviated by holding the gastric end of the silk with a pair of hemostatic forceps. The knots on the second thread were equally as good as and easier of introduction than bougies pushed from below into the small cardiac opening. During the succeeding month, at intervals of four days, this process of division was carried on, and perforated shot clamped on the thread were drawn through to assist in the dilatation. Bougies were afterwards passed and the fistula in the neck was nearly cicatrized.

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Prostatectomy.

Lagoutte (*Gazette Hebdomadaire de Médecine et de Chirurgie*, 1894, p. 134), after an elaborate review of the operations for enlarged prostate, comes to the conclusion that it is only applicable to extremely few cases. The good results of the operations he claims are due mostly to the fact that the bladder has been drained and not to the removal of any obstruction. Excisions of parts of the prostate are satisfactory only where there is a middle lobe that is pedunculated and easily removed or enucleated. In operating by the perineal route the large tube introduced is often a source of great distress, and cannot be borne, and in the larger number of cases the disease again causes obstruction. He advocates the employment of the simple suprapubic cystotomy of Poncet. These cases occur in patients much debilitated and undesirable subjects for long bloody operations, and he urges the employment of the simplest and quickest means which will give the patient comfortable and satisfactory urination.

An Antiseptic Powder.

Pick (*New York Medical Journal*, April 7, 1894) suggests the following antiseptic powder to be used as a substitute for iodoform:

℞	Hydrarg. chloridi corros.	gr. $\frac{1}{5}$ (or $\frac{1}{3}$).
	Acidi borici	℥i.
	Acidi tannici	gr. x.
	Sacchar. lacti, q. s. ad	℥ii. M.

A fifth of a grain of corrosive sublimate is a proportion of 1 to 5000, and a third of a grain 1 to 3000. The mixture, he claims, is a more reliable antiseptic powder than any iodoform preparation, and has no odor whatever. It should, of course, be exceedingly well mixed.

Disarticulation at the Knee-Joint.

Delorme (*Bulletin et Mémoires de la Société de Chirurgie*, 1894, p. 128) amputated a limb through the knee-joint by means of the raquette incision. The cicatrix fell in between the condyles and posteriorly. Neither the condyles nor patella were disturbed. The patient walked satisfactorily on an artificial limb. In the discussion which followed, in reply to a question from Marchand, he stated that he operated as he did, in preference to doing a Gritti amputation, because he recognized no superiority in the latter operation. He stated that the patient bore his weight on the condyles without discomfort, and that the cicatrix was well placed. What more could be desired? Poncet stated that he had practised disarticulation through the knee-joint several times, and was perfectly satisfied with it. The patients walk admirably with the long femoral lever and bear their weight directly on the condyles without pain. He stated also that he saw a case amputated by Gensoul, thirty years ago, who, without experiencing the slightest difficulty, lived a life of heavy labor. For himself, he preferred without hesitation the disarticulation to any of the operations through the condyles. Routier then said that he had seen a case which had been disarticulated by Gerdy, forty years ago, and who still walked admirably on his condyles.

[The above discussion before the Society of Surgery of Paris is interesting in view of the opposition which has been made against operating through the knee-joint on account of the difficulty experienced in fitting satisfactory artificial appliances.—Ed.]

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Modern Antiseptic Lithotrity.

Pousson (*Archives cliniques de Bordeaux*, February, 1894) reviews the operation of litholapaxy, and gives several cases complicated by other troubles. The mortality of crushing stone in the bladder was reduced by Bigelow's operation from over 10 per cent. to 3 or 5. To Guyon is given the credit of introducing antisepsis in urinary surgery. This has reduced the mortality still farther. It reduces the post-operative reaction to a minimum. The existence of fever, cystitis, and pyelonephrosis, only in rare cases, are contra-indications. Even in cases of organic disease the improved operation is often feasible when a cutting operation or even the old method of crushing would be inadmissible.

The same is true of the debility present in cases of long standing and advanced age. Almost the only contra-indications are those which mechanically interfere with the operation, such as stricture of the urethra, excessive size and hardness of the stone, and the calculus being encysted. Of thirty-seven cases in only two was it inadvisable to crush. One of these was a large and hard uric acid calculus, and the other was encysted. Two of the remaining cases died, one of them from an accident, the bladder being perforated during aspiration, and the other from suppurative nephritis, this last patient being already affected with pyelonephritis at the time of operation. Several interesting cases are appended.

In one case when called to operate he found the patient suffering from a chill. Believing this to be due to irritation of the neck of the bladder from the calculi present, he removed them, with satisfactory results.

A second operation was on a man, aged 64 years, who had recently had an attack of renal colic, and was probably affected with pyelonephritis. It was an operation demanded by the extreme sufferings of the patient. One case illustrating the possibility of operating in the presence of disease of the heart is then given. The operation was proceeded with as soon as the edema and ascites, which were present, had been removed. This patient was 74 years old. The last patient was one affected with albuminuria and bronchitis, and was 83 years of age.

Excision of the Tongue.

Butlin (*British Medical Journal*, April 14, 1894) gives a clinical lecture on a series of forty-six cases of removal of one-half or the whole of the tongue. The operations were performed by Whitehead's method, and the lingual artery was tied in those cases in which the disease was seated in the base of the tongue, and in those in which the situation of diseased glands was such that the same incision was suitable for ligature of the artery. He recommends that such wounds be drained for a week or ten days. The after-treatment should be directed to,—

(1) Maintaining the wound as aseptic as possible.

(2) Diminishing the tendency of the discharges to pass down the air-passages.

(3) Preventing food from passing down the trachea into the lungs.

The first indication is best met by the frequent use of powdered iodoform to the wound in the mouth. It should be blown on the wound by means of an insufflator. In addition the patient may use a mouth-wash of Condy's fluid or weak carbolic solution.

The second indication requires that the head be kept low, and that he should lie on one side. The feeding needs very great attention. When only half the tongue has been removed, liquids can generally easily be taken on the day following the operation from a feeder with a spout, provided a piece of India-rubber tubing three or four inches long be fixed to the spout. If the right half has been

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removed the patient should lie on the left side during feeding. When the whole tongue has been taken out the difficulty in swallowing is much greater, and many days may elapse before the patient acquires the knack of swallowing liquids without permitting a small quantity to pass down the air-tubes. During the first forty-eight hours he should be fed by the rectum; then a swallow of water is tried, but if there is any difficulty the patient is fed through a black bulbous catheter, number nine or ten (English scale). There was only one fatal result in the forty-six cases, nineteen of which were on persons over 60 years of age.

Thirty cases were uncomplicated. Thirteen were of one lateral half, and twelve the anterior half or two-thirds. In five the whole of the tongue was removed. One patient, aged 72, nearly died, on the day of the operation, of bleeding, not from the tongue, but, apparently, the back of the throat. There were sixteen complicated operations; of these, two were removals of half the tongue and lymphatic glands, one was removal of the whole of the tongue and lymphatic glands; ten removal of half the tongue and ligation of the lingual artery and removal of glands, and three removal of the whole of the tongue, ligature of the lingual artery, etc.

The fatal case occurred in a man, aged 71 years, in whom the left half of the tongue with some lymphatic glands had been removed. The patient had rigors and high temperature, and died a month and four days after the operation, having been under Mr. Butlin's care for only twelve days following it.

Treatment of Injuries of the Spine and Spinal Cord.

Thorburn (*British Medical Journal*, October 27, 1894) opened a discussion before the British Medical Association on the treatment of spinal injuries. He called attention to the fact that life may be occasionally indefinitely prolonged, even in cases which appear to be hopeless, as in the celebrated case of Hilton, whose patient lived fourteen years with total paraplegia due to fracture of the fifth, sixth, and seventh cervical vertebræ; and also to a case of total paralysis and anesthesia in a woman with fracture of the third dorsal vertebra, whom he had had under observation for the past five and a half years. Further, it is not rare to meet with hematomyelia, due, as he belives, to slight crushing. Although the early symptoms are severe, they rapidly clear up. Hence it is not safe, in our enthusiasm for operation, to assign occasional good results to our treatment. The future of the patient will depend rather on his having escaped with a small hemorrhage or upon the fact that serious secondary troubles have not ensued. In forty-one cases of unilateral dislocation thirty-five were apparently successfully reduced, but in the majority there was no symptom of any injury to the cord at all, and in none was there evidence of a complete crush. He states that in these unilateral cervical cases the attempt at reduction should be made as soon as possible after the injury; it can do no harm and may succeed. In double luxations he had five personal observations; in two reduction was impossible, and in the other three, although the position of the spine was apparently rectified, it recurred at once in spite of fixation by plaster jackets. We cannot hope for the recovery of a crushed cord, and he cannot find any evidence that the reduction has ever cured or materially relieved the medullary symptoms.

When the cauda equina is the seat of injury the prognosis is better.

In the cervical region manipulations are dangerous, and in injuries of atlas and axis they are quite unjustifiable. He limits the useful sphere of manipulation to the unilateral cervical luxations and to bilateral displacements in the lower dorsal

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or lumbar region. As regards laminectomy, he states that he has not found, either in published records of some two hundred cases, or in personal experience of seven, any clear evidence of benefit from the operation. He states, however, that the operation is a valuable one in the following cases:

(1) In compound fractures removal of fragments of bone, etc., is indicated.

(2) In injuries of the laminæ and spinous processes, as there is probably no complete crush of the cord.

(3) When the symptoms are due to hemorrhage,—thecal or perithecal. Such cases are extremely rare.

(4) Pachymeningitis following an injury, even after a prolonged period.

(5) If the cauda equina is compressed relief will probably follow laminectomy. He does not advise plaster jackets before the fifth week.

Sarcoma after Fracture.

Griffiths (*Lancet*, May 26, 1894) describes the case of a man, aged 21, who fell on the ice and fractured his left thigh at the junction of middle and lower third. It was a simple fracture. He remained in the hospital five weeks, and two weeks later the plaster cast which had been applied was removed. All appeared well. Ten weeks after the accident a swelling was observed at the seat of fracture. This rapidly increased in size, all operative procedures were refused, and he died eight months after the injury. The growth was found to be a small spindle-celled sarcoma which appeared to start from the periosteum. There was no evidence to suggest the presence of a growth at the time of the accident.

Intestinal Approximation.

Murphy (*Chicago Clinical Review*, June, 1894) presents his views in regard to intestinal approximation as follows: (1) The more rapidly the operation is performed the less the danger from shock. (2) The less the manipulation and exposure of the intestine, the less the danger of infection, post-operative paralysis, and adhesions. (3) The more uniform and continuous the pressure at approximation, the greater the assurance of adhesion and the less the liability of infiltration. (4) A line of approximation is as good as half an inch. (5) Mechanical means in the last six years have produced better results than the suture, in both lateral and end-to-end approximations. (6) The mortality in end-to-end approximation is much less than in lateral apposition, and it should always be given the preference. (7) The more perfect the juxtaposition of the various layers, the less the interposition of fibrous tissue and the more complete the regeneration across the line of union. (8) The more extensive the approximation surface, the larger the fibrous deposit, the greater the contraction. (9) The contraction with end-to-end is less than with lateral approximation. (10) The juxtaposition of the similar histological layers of the wall of the intestine is an assurance against cicatricial contraction.

(11) The *modus operandi* of the button is based upon the following principles: *First*, it retains apposition automatically,--that is, without suture; *second*, union of tissue is produced at the line of pressure atrophy; *third*, the pressure atrophy is produced by elastic pressure; *fourth*, it produces juxtaposition of the edges of the same coats; *fifth*, the union is accomplished by the smallest possible cicatrix, and therefore must yield the least contraction of any operation; *sixth*, the rapidity of application gives all the advantage that the saving of time can accomplish.

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THERAPEUTICS.

UNDER THE CHARGE OF

HORATIO C. WOOD, M.D., LL.D., AND ARTHUR A. STEVENS, M.D.

IMMUNITY AGAINST DIPHTHERIA.

BEHRING (*Deutsche medicinische Wochenschrift*, November 15, 1894) considers the dose of antitoxin necessary to protect the individual against diphtheria. Along with Ehrlich he found that in communities in which diphtheria was prevalent sixty units, or one-tenth of the curative dose, were sufficient to afford protection. Among 10,000 thus treated only ten acquired diphtheria. Those who have developed diphtheria after the exhibition of sixty units have had a mild attack, nevertheless, the author recommends 150 units.

When the infection has been virulent, and treatment instituted towards the close of incubation, 600 units, a full curative dose, may be unable to prevent the development of the disease. Antitoxin is excreted by the urine, and immunity ceases when all is eliminated. Several small doses at intervals are more serviceable than a single large dose. The author prefers a concentrated serum.

THE TREATMENT OF DIPHTHERIA WITH THE ANTITOXIN.

WASHBOURNE, GOODALL, AND CARD (*British Medical Journal*, No. 1773, 1894) report the results of the antitoxin treatment in 72 cases of diphtheria in children under 15 years of age. Diphtheria-bacilli were found in but 61. Among the 72 cases there were 14 deaths (19.4 per cent.). From January 1, 1893, to October 22, 1894, the mortality in 797 cases was 310 (38.8 per cent.). Of the 61 cases in which diphtheria-bacilli were found 13 died (21.3 per cent.). Among the whole number tracheotomy was required in 9 cases, with 3 deaths.

KOSSEL (*Deutsche medicinische Wochenschrift*, No. 51, 1894) reports 117 cases of diphtheria treated with the antitoxin, with a mortality of 11.1 per cent.

Of 14 cases treated on the first day, all recovered; of 30 cases on the second day, 29 recovered; of 29 cases on the third day, all recovered; of 9 cases on the fourth day, 8 recovered; of 6 cases on the sixth day, 3 recovered; of 5 cases on the seventh day, 3 recovered; of 6 cases on the eighth day, 3 recovered; the one treated on the ninth day died; of 6 cases treated on uncertain days, 5 recovered. Diphtheria-bacilli were found in all but one case.

PICROTOXIN.

SEMMOLA AND GIOFFREDI, of Naples (*Universal Medical Journal*, December, 1894), remarked before the Ier Congrès Français de Médecine Interne upon the necessity, before administering an antisudorific, of thoroughly understanding the pathogeny of secretive disturbance. If this be due to irritation of sudoriferous nerves, remedies such as agaricine, atropine, etc., should be given; but if it be due to central vasomotor paralysis, excitants, such as picrotoxin, should be administered.

They reported the case of a woman, 43 years old, affected with hyperidrosis consecutive to influenza, frequently occurring in combination with peripheral vasomotor disturbances, in the form of more or less extensive red patches. There was no functional or subjective alteration of the nervous system. Atropine, agar-

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icine, camphor, camphoric acid, gallic acid, etc., were tried without success. Picrotoxin was then employed, and three days later the sweating began to diminish, and within eight days completely disappeared. The daily dose was one-sixty-fourth of a grain.

Treatment of Goitre by Thyroid Feeding.

Bruns (*Deutsche medicinische Wochenschrift*, October, 1894) has tried thyroid feeding in cases of goitre, especially in young people. Cystic goitre, of course, is not amenable to this treatment. In twelve cases the goitre disappeared either entirely or in great measure in nine. In four cases completely cured, the thyroid was enlarged in all its parts, the one-half being about the size of a hen's egg. In one case there was stridor with difficulty in breathing, which also disappeared.

In three patients, aged 23 to 57 years, the results were negative. The treatment lasted six days in one case, and fourteen days in the other two. Strumectomy showed in one case a hyperplastic goitre with small cysts, and in another abundant colloid substance. In only one case did treatment give rise to unpleasant symptoms,—namely, headache, frequency of pulse, and loss of weight. This occurred after forty-six grains were taken, distributed over fourteen days. The author concludes that thyroid feeding exercises a specific effect on many goitres, causing their rapid diminution or disappearance. The number of cases is still too small to admit of conclusions, but it is desirable to know what kinds of goitre can be thus treated. Provisionally it would appear to be relatively recent non-cystic goitre, especially if occurring in young people.

The Use of Vaso-Constrictors in Cardiac Disease.

Wilcox (*Medical Record*, February 2, 1895) speaks of the value of vaso-constrictors in cardiac disease. In patients in whom the cardiac disease is secondary to disease of the arteries, vaso-constrictors are not indicated. In an under-compensated heart, irrespective of whatever valvular lesion may exist, we can, by use of these remedies, exactly regulate the amount of work which the heart is made to perform.

Obviously, by narrowing the calibre of the peripheral systemic arteries and arterioles, we may increase the obstacle to the flow of blood, and thus to a nicety regulate that which the left ventricle is called upon to do. By thus regulating the work of the left ventricle we may set up hypertrophy of muscular tissue in its walls, and in this way bring about compensation. Not only does increased blood pressure result in more blood being sent into coronary arteries, but more efficient cardiac contraction, and a more rapid circulation in the cardiac muscles, thus improving the nutrition of the heart. If it be asked in what circulatory condition digitalis finds its most useful indication, it can be said, as Fothergill long ago pointed out, that it is when the pulse is rapid, broad, and of low tension. It is here that passive congestions are most frequently found, and hemorrhages are apt to occur. Digitalis is useful because it acts as a vaso-constrictor, slows the heart, thus prolonging the diastolic rest, and renders the systoles more perfect. The disadvantages of digitalis, so far as its vaso-constrictor action is concerned, lie in the slow establishment of the condition, its persistent duration, and that it is not so amenable to the antagonists,—the vaso-dilators.

The author regards ergot as the most generally useful vaso-constrictor. The mode of employment in cases of cardiac disease, marked by a pulse of low tension and a tendency to passive congestions, has been to diminish the calibre of

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the arterioles by ergot, and to strengthen the heart, if rapid, by strophanthus or sparteine, which have slight action on vaso-constrictors, the last almost none at all. If the pulse is already slow, the heart can be stimulated by caffeine, or preferably cactus, the last being inert unless made from the green plant. In these cases the writer has found, after years of clinical observation, that this process of bringing about compensation in relatively weak hearts was more easily accomplished, and in shorter time, and by far more safely than by digitalis.

Potassium Permanganate as an Antidote to Cyanide Poisoning.

Kossa (*Centralblatt für die medicinische Wissenschaft*, No. 17, 1894) has shown that animals to which were administered toxic doses of potassium cyanide could be restored by the immediate administration of potassium permanganate. In one animal so treated, a dose ten times the lethal one failed to kill. When toxic doses of the cyanide were mixed with potassium permanganate, and the mixture was allowed to stand some hours, its administration was followed by no bad effects. The cyanide is probably converted into a hydrocarbonate, then into a carbonate, and, finally, into urea.

OBSTETRICS.

UNDER THE CHARGE OF

BARTON COOKE HIRST, M.D.,

ASSISTED BY

RICHARD C. NORRIS, M.D., AND FRANK W. TALLEY, M.D.

The Diagnosis of Pregnancy in the Early Months.

Landau (*Deutsche medicinische Wochenschrift*, No. 52; 1893) believes that the exact estimation of the beginning of pregnancy is not possible as, apparently, the ovulation occurs independently of menstruation. The size of the uterus is in the early months also an unsafe guide. The form and consistence of the uterus is more reliable. It is enlarged evenly and in transverse diameter, so that the anteflexion is increased, the vaginal portion is drawn up, the vagina elongated, and the anterior vaginal wall appears tenser than otherwise. The consistence is softer, the sensation being as though the examining finger was pressed in soft butter, the finger passes in, finds no resistance, and returns no impression. Hegar's sign may be recognized in 30 per cent. of the cases; the same sensation as is perceived by palpating the lower uterine segment may be obtained by palpating the tubal angles. The consistence of the anterior and posterior uterine wall is irregular, usually the anterior is softer and looser than the posterior, which probably has some relation with the attachment of the placenta. In the examination attention should be paid to the fact that one cannot recognize all these signs at one time, as the uterine contractions soon occur and interfere. It is necessary to examine frequently. The other usual signs of pregnancy should also be taken into account.

Landau's paper was founded upon over 200 cases of pregnancy, from the third to the twelfth week, and refers only to the normal position of the uterus.

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Is Secale Cornutum an Abortifacient?

Ungar (*Deutsche medicinische Wochenschrift*, No. 46, 1892) has published his views on this subject in a thesis by Egeln. He answers this question in the affirmative from a medico-legal stand-point, as the secale, although it frequently does not interrupt the pregnancy, yet in moderate doses it is possible that its specific action upon the pregnant uterus may be exerted, followed by the expulsion of the uterine contents.

Placenta Previa.

Cumston (*Annals of Gynecology*, September, 1894) gives the following directions for preparing the tampons used in the treatment of placenta previa.

Sterilize good absorbent cotton by placing in a sterilizer and boiling for ten minutes, draining in a sterilized, perforated steel box for twenty-four hours. Having sterilized the hands, make the cotton into tampons, and place about forty into a medium-sized sterilized glass jar. Pour into the jar the following solution:

Iodol	10.0
Alcoholis absolut., q. s. ad perfect sol.	
Glycerin pur.	200.0

Before introducing the tampons into the vagina, cover them with a thin layer of 3 per cent. carbolized vaseline, which forms a sort of cement not penetrated by blood. Insert fifteen or twenty of these tampons, about the size of a walnut, into the vagina, in such a way that the cavity is transversely dilated and reaches the walls of the pelvis.

Observations Concerning the Etiology of Vomiting in Pregnancy.

Giles (*Provincial Medical Journal*, August, 1893) estimates that one-third of all pregnant women are free from morning nausea during the entire pregnancy, and 45 per cent. remain during the first three months free from it. One should not, therefore, place great weight upon the presence of this sign. If it occurs, it presents itself in 70 per cent. in the first month of pregnancy, seldom in the second, third, or fourth months, almost never in the fifth and sixth month. In about 9 to 10 per cent. it begins first in the last three months. The duration varies from a few days through the entire pregnancy. In unmarried women it occurs with relative frequency in the last six months. Between 20 to 25 years it is least frequent, 90 per cent. of primiparæ over 25 years suffer from vomiting. In the third pregnancy it occurs less frequently than in others. Should it occur, and in the later months, it begins more violently than that in the first months of the first two pregnancies. Comparing primiparæ with multiparæ, the vomiting lasts by 13 per cent. more frequently during the beginning and middle months in the former, through the entire pregnancy by 9 per cent. in the latter. About the end of the pregnancy the violence of the vomiting grows with the weight of the child and the placenta, but does not disturb the nourishment of the fetus. Women who habitually menstruate scantily and without pain suffer less than those who have painful and copious menstruation. The vomiting of pregnant women depends upon the action of these factors:

From the increased nervous excitability.

From a local source of irritation.

From a rapid conduction of the nervous energy.

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Lupus and Pregnancy.

Bar and Thibierge (*Gazette Médicale de Paris*, No. 52, 1893) have observed the influence of pregnancy upon existing lupus in thirteen cases. In these observed cases during the course of the pregnancy the lupus in each case returned, but immediately upon the return of the menses disappeared.

A Newly-Born Child of Heavy Weight.

Read (*Australian Medical Gazette*, June, 1893) attended a case of labor which was tedious and difficult. The child, a female, weighed sixteen and a half pounds. The mother had, at an earlier pregnancy, given birth to a male child weighing fourteen pounds. The greatest weight of a new-born child in the literature was fifteen pounds.

Spontaneous Rupture of the Symphysis during Labor.

Hartwig (*Medical News*, August 19, 1893) reports the case of a woman who was delivered naturally, in whom the symphysis ruptured during the labor while the attending physician had his finger in the vagina. An abscess formed. The cartilage appeared to have been entirely separated. The abscess was drained and the hips bandaged. In six weeks the woman could go about without difficulty.

Concerning the Obstetrical Importance of Extraordinary Development of New-Born Children.

A. Marx (*Inaugural Dissertation*, Erlangen, 1893) refers to three cases in the Erlangen klinik, which were as follows: Female, dead, 61 : 4260; male, asphyxiated, resuscitated, 60 : 5340; male, asphyxiated, not resuscitated, 62 : 5870.

The circumference of the heads was not especially large. It was in two cases 36.5 centimetres.

Etiologically, heredity is an important factor. In the above cases an hereditary tendency to extraordinary development could be traced on the side of the mother. In one of the mothers the circumference of the calf of the leg was 70 centimetres. It is noteworthy that all three mothers arrived early at puberty,—in the fourteenth year.

Therapeutically, symphyseotomy is in the first place indicated.

A Porro Operation with Good Result.

Colahan, of Galway (*Dublin Journal of Medical Science*, August, 1893), states that in Ireland there have been until the present time only three Porro operations performed, the third being a case operated upon by himself, and the first in which the mother and child were saved. The case was that of a 40-year-old dwarf, thirty-nine inches tall. Labor occurred at term. Os could not be reached. The conjugate was under two inches. The operation was without incident; the stump fell on the eighteenth day. Patient rose from her bed at the end of the third week. Mother and child were discharged well. In an earlier case recorded by Macan, after conservative Cesarean section, pregnancy occurred again. In the preparation for a second Cesarean section the scar of the uterus ruptured, and the patient died in collapse. Colahan was guided in his choice of operation by desire to prevent future pregnancies.

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The Urination in Lying-in Women.

Recht (*Thèse de Paris*, 1894) gives the views upon the causation of retention of urine in the lying-in, and gives a short history of catheterization in the parturient state. He then refers to 291 lying-in women observed by him in the Baudelocque Clinic at Paris. These had all spontaneously and on an average time, thirteen hours and twenty-two minutes after their labor, passed urine. One hundred and fifty of these were primiparæ. In these the first urination occurred on an average fifteen hours after the labor. The shortest time was two hours, the longest thirty-six hours. The 141 multiparæ have on an average spontaneously urinated ten hours after the labor. Of these the shortest time was one hour, the longest forty-seven hours. Injuries of the perineum and weight of the child appeared to have no influence upon the time of emptying of the bladder. After forceps operations and breech deliveries, however, there was a delay in the urination.

While in the other Paris maternities the patient is catheterized in twelve hours after the labor, should she not previously have emptied her bladder spontaneously, in the Baudelocque Clinic it is the rule to wait so long as the woman does not complain of pain, even if the spontaneous urination does not occur till forty-eight hours. Of 6666 cases delivered in this clinic in the last four years, only twenty cases required to be catheterized. Changes in the position of the uterus and post-partum hemorrhage from the uterus have not been observed from this method of waiting, while it is found that if the patient were catheterized, a repetition was often necessary on the next day.

Twin Pregnancy: Expulsion at Six Months of a Living Fetus and an Embryo of Three Months.

M. Dufour (*La Médecine Moderne*, August 4, 1894) reports the case of a woman, 30 years of age, multipara, whose menses ceased May 10.

For about two and a half months all went well. On August 4 a profuse hemorrhage came on, and from that time until November 2 this condition of flooding existed more or less. During this time she felt the movement of her child, and the gestation developed normally in all other respects.

On November 2, about six months after the cessation of the menses, there was produced very rapidly, with not more than four uterine contractions, a miscarriage (without any subsequent hemorrhage) of a female infant. At the moment of delivery something like a cotyledon detached from the placenta could be felt in the vagina. The placenta was complete, bloodless, pale, and granulated.

The little mass resembled an egg, with its membranes; opened with scissors, a small amount of liquid escaped, disclosing an embryo of scarcely three months, the different constituent parts of which were quite evident, but in a condition of degeneration. There was an adherent placenta in the same condition.

The child of six months lived some hours.

This coincidence of two germs, the one dead, which nature endeavored to expel by means of the hemorrhages, the other living, notwithstanding the serious functional disturbance of the uterus, is quite rare.

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GYNECOLOGY.

UNDER THE CHARGE OF

CHARLES BINGHAM PENROSE, M.D.,

ASSISTED BY

WILLIAM A. CAREY, M.D., AND H. D. BEYEA, M.D.

THE PROGNOSIS OF HYSTERECTOMY FOR CARCINOMA OF THE UTERUS.

CASELLI, DURANTE, AND D'ANTONA (*Gazette médicale de Paris*, No. 48, 1893), at the Italian Surgical Congress, spoke very discouragingly regarding the results of total extirpation of the carcinomatous uterus. They have seen a return of the disease in all cases, often in a very short time, and also in those cases where the operation was performed in the beginning of the carcinomatous disease. Durante believes that cases reported as cured were not correctly diagnosed.

THE PRESENT STATUS OF THE TREATMENT OF PELVIC INFLAMMATION.

W. B. DORSETT (*American Journal of Obstetrics*, November, 1894) presents the following conclusions:

Pus in quantities is hard to deal with drawn in the pelvis in laparotomy cases, and, if possible, should be evacuated prior to taking out the tubes and ovaries, either through the cul-de-sac of Douglas, or, if between the layers of the broad ligament, at the side of the uterus, the laparotomy to be done at some future time.

Pus-sacs in the tube near its uterine end can be evacuated through the uterus by packing the horn.

Parametritis is, except in rare instances, a secondary trouble, due to a foul uterine cavity. Clean out the cavity, and stop the source of poison.

THE OPERATIVE TREATMENT OF BACKWARD DISPLACEMENTS OF THE UTERUS.

E. W. CUSHING (*Gynecological Transactions*, Vol. XVIII) draws the following conclusions from a study of the above subject:

Many cases of retroflexion and retroversion, if uncomplicated, cause little or no disturbance, and, therefore, require no operation.

Severe retroflexion in virgins, giving rise to symptoms sufficiently severe, is better relieved by operation.

Cases that resist simple measures, as the pessary, are usually found to have some complication that necessitates operation. The only operations worthy of trial are the Alexander-Adams operation, or the shortening of the round ligaments by abdominal section and ventro-fixation. Alexander's operation is subject to the following limitations: freely movable uterus, exact diagnosis, favorable anatomical conditions. When these conditions are not present an abdominal section had better be done, and the case treated according to circumstances. If no complications are present, the uterus may be secured in anteposition by shortening the round ligaments internally, and by placing at each cornu uteri a suture passing through the abdominal wall. This operation is regarded by the author as equally safe, and on the average more reliable than the Alexander procedure.

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The Treatment of Myomata Complicating Pregnancy.

F. B. Jassatt (*British Gynecological Journal*, November, 1894) concludes an interesting paper upon this subject as follows:

(1) In those cases of subperitoneal myoma which are either pedunculated or situated in the body of the uterus, if growing rapidly or of large size, the surgeon would be justified in opening the abdomen and enucleating the growths.

(2) In cases where there are a large number of subperitoneal and interstitial myomata of considerable size studded over the uterus, and these are found to be increasing, the whole organ and tumor should be removed.

(3) In cases of interstitial or submucous fibromyoma complicated with pregnancy, statistics seem to show that the risk to the patient is greater if left to go to the full period than if abortion is produced or the organ removed.

(4) Cases in which the cervix is the seat of the disease may be allowed to go their full term, as the growth, if presenting in the vagina, may be either enucleated or removed by *morcellement* at the end of gestation.

Statistics Relative to Fibromyoma of the Uterus.

The *British Gynecological Journal*, November, 1894, abstracts an article written by Tervillon, from which the following conclusions were drawn:

During the past thirteen years Tervillon examined and kept himself informed about the condition of 235 cases of this disease.

Of this number 122 were subjected to operation. Eighty abdominal hysterectomies were done, 45 having the pedicle treated intraperitoneally and 35 extraperitoneally. Thirty cases had the ovaries removed, with no death. There were 12 vaginal hysterectomies, with 2 deaths.

In none of the cases in which the ovaries were removed was there any diminution of the size of the tumor. Of the cases not subjected to operation the writer considers the best treatment to be rest in bed with an abdominal binder in position. While a few cases were benefited symptomatically by the use of electricity, he never observed any diminution in the bulk of the tumor in the ninety cases which he examined with special reference to this question. He believes that neither electricity, mineral water, nor the menopause ever has any effect in lessening their growth, but that they may grow up to or beyond 60 years of age.

The Operative Treatment of Uterine Fibroids.

Cushing (*Annals of Gynecology and Pediatry*, September, 1894) presents an interesting paper upon the above subject, from which the following conclusions are deduced:

Electricity is useless and dangerous, and has no place in the armamentarium of the surgeon.

No method will compare with that of extraperitoneal treatment of the stump in favorable cases,—that is, where the abdominal wall is not too thick, and the tumor can be lifted out so that a constrictor can be applied around the whole pedicle, including the uterine appendages; the advantages of this operation lie in its rapidity of execution, and the short time that the abdomen is exposed to manipulation and to the air; with proper care there need be no sloughing of the stump, and little or no suppuration of the wound. This is the author's operation of election for the present, particularly in those cases of feeble health where it is feared a more prolonged operation would not be well endured. For the intra-extraperitoneal treatment, the author will in future leave as little of the cervix as possible,

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dilate it, burn, and drain it. This method is applicable to cases where it is difficult to apply the former method, owing to thickness of abdominal walls, rigidity of pelvic floor, or the presence of dense adhesions requiring drainage.

No advantage is gained by leaving any of the cervix; to avoid sloughing of this portion it must be amputated well down below the level of the internal os after separation of the bladder from the cervix and ligation of the uterine arteries. When all this has been done there is no difficulty or loss of time in removing all the uterine tissues. Drainage should usually be employed both through the vagina by gauze, and by a glass tube at the bottom of the pelvis, as there is pretty sure to be free oozing. The extra amount of time needed for this procedure, or for total ablation, being half an hour to an hour longer than for the extraperitoneal method, and the increased risks from manipulation of the pelvic viscera, and from shock, are factors of great importance, and cause the author to resort to those operations only when there is some obstacle to the successful treatment of the case by the extraperitoneal method.

The Technique of Vaginal Hysterectomy.

Edebohls (*American Journal of the Medical Sciences*, January, 1895) says, in concluding a paper upon the above subject, that the one great disadvantage of the vaginal operation lies in the fact that it is sometimes difficult to remove the tubes and ovaries when such removal is necessary. The diseased adnexa are adherent high up in the pelvis, and it is possible that the atrophy and shrinking of the ovaries and tubal attachments following the menopause may contribute to the bringing about of this condition, and help to make it difficult to bring down the parts into the field of operation. The after-treatment of vaginal hysterectomy with closure of the peritoneum is a very simple matter. The urine is drawn until the fourth day, when the gauze is removed from the vagina. After that the patient uses the bed-pan in emptying her bladder, receiving a vaginal douche of 1 : 3000 sublimate immediately after each urination. When the peritoneum has been left open and tamponnaded with iodoform gauze, this gauze is removed on the fourth day, and a small quantity of fresh iodoform gauze introduced. This is removed on the seventh day, after which the vagina is douched after urination, as in the cases with closure of the peritoneum. Patients may sit up from the ninth or tenth day on, and generally leave the hospital at the end of three weeks. The author arranges the methods of performing vaginal hysterectomy under the following heads:

Serial ligation of the broad ligaments.

The clamp operation.

Enucleation with ligation of bleeding vessels only. Of the last method the author says, it was originally practised in isolated cases elsewhere, but first became established as a routine practice in our country, and is rapidly gaining adherents. The writer has abandoned the clamp operation. Serial ligation of the broad ligaments presents the serious objection of unnecessary constriction of vital tissues richly supplied with nerves, blood-vessels, and lymphatics. Ligation is required merely to check hemorrhages, and this object can be obtained by simply tying the bleeding vessels; all constriction or crushing of tissue beyond this is uncalled for, harmful, and illegitimate. Such a method is indicated exclusively in cases of malignant disease when we wish to give the uterus as wide a berth as possible. Enucleation of the uterus, with ligation of the bleeding vessels only, appeals to the writer's mind as a surgically ideal method of hysterectomy, suprapubic and vaginal. All of his cases treated by this method (one abdominal and nine vaginal) have made good recoveries.

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Total Extirpation of the Uterus for Myofibroma complicated by Pregnancy.

C. N. Smith (*American Journal of Obstetrics*, September, 1894) contributes the history of a case, aged 27 years, in which pregnancy occurred in a uterus which was invaded by a myofibroma of such size that the uterine mass (tumor and fetus of four months combined) filled the pelvis and reached to the umbilicus and caused some pressure symptoms. A Porro operation was determined upon, and the patient subjected to abdominal section. Upon examining the tumor it was uncertain just what portion of it was occupied by the fetus, although the upper zone was thought to contain it. To demonstrate this point an aspirating needle was thrust into the upper part to see if amniotic fluid could be obtained. None being withdrawn, it was concluded that a mistake had been made, and that the fetus occupied the lower zone of the tumor, and that the upper portion was a telangiectatic or cavernous myoma. Upon this supposition it was decided better to allow pregnancy to continue under close supervision, bringing on a miscarriage if necessary, and the abdomen was accordingly closed. No mishap followed this manipulation. Upon further consideration of the case, Smith decided that an error had been made, and that the fetus occupied the upper or cystic portion of the mass, and, therefore, decided to reopen the abdomen, which was done fifteen days after the first exploration. Two facts led him to this determination: the tubes were attached to the upper portion of the tumor, and a sound introduced into the cervix passed up six inches without meeting with any obstruction. The abdomen was opened through the scar made by the first operation, and the tumor removed without special difficulty, first separating the vaginal attachments, and pushing off the bladder and clamping the uterine arteries from the vagina. After removing the tumor the uterine arteries were ligated, the clamps removed, and the ligatures brought down into the vagina, which was packed from above with iodoform gauze. With the exception of the ovarian arteries all ligatures were so placed as not to include peritoneum in their grasp. The ligatures in the ovarian arteries were cut short. The edges of the peritoneal flaps were brought into apposition by catgut sutures, and the peritoneal cavity cut off completely, leaving all stumps and ligatures (except those of the ovarian arteries) outside. The cavity was sponged dry and closed without irrigation or drainage. The tumor weighed eight pounds. The patient made a most satisfactory recovery.

PATHOLOGY.

UNDER THE CHARGE OF

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JOSEPH McFARLAND, M.D.

The Preparation of Diphtheria Antitoxin.

J. J. Kinyoun (*Abstract of Sanitary Reports*, Washington, D. C., December 21, 1894, Vol. IX, No. 51), in an article upon "The Serum Therapy of Diphtheria," gives the following as the method employed in Roux's laboratory in Paris, for the production of the antitoxic serum:

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The toxines are prepared from a bouillon culture of virulent diphtheria bacilli. . . . . A virulent culture is selected of the bacillus diphtheriæ,—one which is fatal to a 500-gramme guinea-pig in from twenty-four to thirty hours. From this culture a flask of alkaline peptone bouillon is inoculated. After it has remained in the thermostat for twenty-four hours, at a temperature of 36° C., it will be found rich in bacilli. This culture may be termed the stock culture for others which are destined for the toxines. For this latter a special form of culture flask is employed, in order to permit of a special method of cultivation of the bacilli whereby the toxines formed are much stronger and, it is claimed, somewhat different in character than when the ordinary methods are employed. The flasks used are known as the Fernboch flasks, and are large, flat-bottomed, Florentine flasks, provided with a tubulature on the side within an inch of the bottom. The neck and tubulature are constricted near the mouths for the reception of the proper cotton plugs. These flasks are filled to a short distance below the tubulature with an alkaline peptone bouillon and then sterilized. Soon after this the flasks are inoculated with a bouillon culture of the bacillus diphtheriæ, about forty cubic centimetres to each flask. They are then placed in the thermostat for twenty-four hours in order to "start" them, when each flask is connected with an aspirator, and a current of air is slowly kept moving through the flask in the direction from the mouth to the tubulature. The air before entering the flask is passed through an ordinary wash-bottle in order that it may be moist, so as to prevent evaporation, which would occur, as well as to maintain the best conditions for culture. This method, so far as I know, is practised only in this institution (Institut Pasteur, Paris). It is the discovery of Dr. Fernboch, who observed that so long as the bacterium remains in the active living state,—or, in other words, maintains its integrity,—little or none of those substances known as toxines or ptomaines are set free, but as soon as you present the conditions most favorable for the development of bacteria, the life of the individual bacterium is shortened, and it completes its cycle, ending in proliferation and setting free the nucleins from it.

When a bacillus, such as that of diphtheria, is grown under the same conditions as cited above, there is a greater quantity of the nucleins formed than would occur under the ordinary conditions of culture.

These flasks are kept at a temperature of 37° C. for from three to four weeks. At this time the bouillon is rich in flaky masses of the bacilli. If examined microscopically, the masses are found to be nearly, if not all, disintegrated masses of the bacilli. Sometimes a few bacilli are encountered, but they have, in great measure, lost their characteristic form.

Without further preparation, the cultures are filtered through a Chamberland filter-tube into sterilized flasks, and kept until required for use. Each lot of the toxines is tested for virulency by standardizing it by injections into guinea-pigs, the usual strength being such that one-tenth cubic centimetre will kill a 500-gramme guinea-pig within twenty-four hours.

The filtrate will preserve its virulency for a considerable time, provided it is kept away from light and maintained at an equal temperature. Boiling the cultures, or even heating them to a degree that will kill the bacilli, is not practised, for it has been found that either process impairs their strength as well as changes some of their properties. Large quantities of cultures are kept growing, a special room being employed for this purpose, as each horse will require a large amount of the toxine to immunize it and to maintain the antitoxin in the blood after immunization is completed.

The antitoxin for the treatment of diphtheria is in solution in the blood of an

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animal rendered refractory to the disease. Immunity in an animal may be produced in one of two ways,—by injections of the toxines or by inoculations of the bacilli. The former method has been found to be the best, and at present is the only one in use. In the experiments of Professor Roux and Dr. Martin, animals of all kinds were used, but now they use the horse, as it has been found to be the most satisfactory. It stands the process of immunization better, and gives a serum stronger than other larger animals,—*i.e.*, in the same length of time, besides furnishing a larger amount of serum.

The present method of immunizing the horse is somewhat different in its details from that given in Professor Roux's paper, being much simpler.

A horse is selected which is sound, having been subjected to injections with tuberculin and mollein, the age not playing any particular part; usually it is from 6 to 8 years,— a cub horse which has seen better days. At first a trial injection of the toxine is made, usually less than a cubic centimetre, carefully noting the general and local reaction. In some horses even the trial dose has a profound effect, but usually there is considerable local and general reaction. If the animal becomes quite ill a small quantity of Gram's solution is added to the next dose, and even the next following if the reaction is too strong. After this the horse bears the increasing dosage with little or no discomfort.

The general plan of the injections is as follows: First day, ½ c.c. of pure toxines, of which $\frac{1}{10}$ c.c. is fatal to 500 grammes of guinea-pig; eighth day, 1 c.c.; fourteenth day, 1½ c.c.; twentieth day, 2 c.c.; twenty-eighth day, 3 c.c.; thirty-third day, 5 c.c.; thirty-eighth day, 8 c.c.; forty-third day, 10 c.c.; forty-seventh day, 20 c.c.; fifty-first day, 30 c.c.; fifty-sixth day, 50 c.c.; sixty-second day, 50 c.c.; sixty-eighth day, 60 c.c.; seventy-fourth day, 100 c.c.; eightieth day, 250 c.c.; eighty-eighth day, 250 c.c.

When the first injections are given there is quite a marked local and general reaction to the poison; there is an edema at the point of the injection, which is followed by a distinct inflammatory process,—hard in the centre and soft and edematous at its periphery. The general reaction is manifested by a rise in the temperature, 1°–2° C., loss of appetite and occasional cramps. The reactions must be taken as the guide in the future dosage, and a sufficient time must be allowed to elapse between the injections for the complete recovery from the general and local effects. As the quantity of the toxines is increased the general effects generally decrease, perhaps a rise of a degree for twenty-four hours. The local effect partakes more of an edema, and has the character of an inflammation. At a certain stage, usually after two months' treatment, when fifty to sixty cubic centimetres can be injected without harm, there is no general reaction, but a large edema at the site of the injection, which disappears within from twenty-four to forty-eight hours. Towards the last, even when 200–300 cubic centimetres are given, there is only an enormous edema, which disappears within from twelve to eighteen hours. When these inordinately large quantities can be given with only a local reaction being manifest, the horse has come well under the influence, and the blood will be found rich in the antitoxin. There is a curious fact well worth noting; at the end of the second month of the treatment, when the horse can bear as much as fifty to sixty cubic centimetres of the toxines without discomfort, the blood will be found to contain but little of the antitoxin. The antitoxin only appears after repeated stimulation of the cells (?) by the large and frequent doses of the toxines.

The subcutaneous injections do not yield a serum as rich in the antitoxins as when the toxines are injected directly into the blood-current. When it is desired

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to do this, towards the last of the treatment, the toxines are injected directly into the jugular vein. The process is tedious and requires a longer time, and for practical purposes has not been found so satisfactory as the simple subcutaneous injection.

The strength of the serum is tested by using young 500-gramme guinea-pigs. One gramme of the serum will usually protect 50,000 grammes of guinea-pig against a fresh virulent culture of the bacillus diphtheriæ.

This is the strength that is used in hospitals. By the intravenous injections, a serum of the protective strength of 1-100,000, can be obtained.

For practical purposes the 1-50,000 strength has been found as satisfactory as the stronger.

The abstraction of the blood from the horse is a simple procedure, the blood being drawn from the jugular vein by means of a special trocar and canula. The trocar and canula are about four millimetres in diameter, and are somewhat larger than the ordinary form. The top of the canula is shouldered so as to receive a metal plug which is also canulated. This metal plug is attached to a rubber tube a half metre in length; to the other end of the tube is attached a glass tube ten centimetres in length. The instruments, tubes, etc., are sterilized, and then kept in a 5-per-cent. solution of carbolic acid. Ordinary wide-mouthed bottles of 2500 cubic centimetres are used for receiving the blood. These are prepared by having pieces of paper tied over the mouths, and over this another paper in the shape of a hood is placed; the bottles are then sterilized. When all these preliminaries are finished, the horse is made ready for bleeding; a small "twitch" is placed around the upper lip and made taut; the blindfold is thrown over the eyes. The hair is next clipped from over the place for the insertion of the trocar, and the place is then scrubbed with carbolic acid, 5-per-cent. solution. The skin is incised sufficiently to allow the trocar to pass through the tissues without the force that would be required to puncture the vein if the skin was intact, thus preventing accidental wounding of the vein. The jugular vein is compressed by the hand and the trocar is passed well into the vein, the point being directed downward. While this is being done, the assistant holding the bottle plunges the glass tube into it, then the trocar is withdrawn, and the canulated plug is inserted into the canula.

Six to eight litres are taken from the horse at one bleeding. When the bottles are filled to the desired height the blood is allowed to coagulate, when it is placed in the ice-chest. Within twenty-four hours the serum will be found to have separated. Usually from two and a half to three litres are obtained at each bleeding. The serum is withdrawn from the bottles by means of the Pasteur filling pipettes, and transferred to the proper receptacles for use and preservation. . . . . A small piece of camphor is placed in each bottle. This, it is claimed, tends to preserve it should any chance micro-organism drop in, and exerts an inhibitive influence against its deterioration.

MISCELLANEOUS.

THE EXAMINATION OF GYNECOLOGICAL SPECIMENS.

In order to extend the usefulness of the Pathological Laboratory of the Gynecological Department of the University of Pennsylvania, the following plan has been adopted:

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Any physician may send to the pathological laboratory any specimen for examination on which the diagnosis or the prognosis of a gynecological case may depend. A fee of five dollars will be charged for such examination in case the patient is able to pay. If the physician states that his patient is too poor to pay, the examination will be made free. The necessity for some arrangement of this kind, especially in making an early diagnosis of malignant disease of the uterus, is widely felt.

This offer applies to private, not to hospital, patients. The specimen should be placed in 95 per cent. alcohol, and directed to the Professor of Gynecology, Hospital of the University of Pennsylvania, 3400 Spruce Street, Philadelphia.

A brief history of the case should be sent with each specimen.

A report will be returned to the physician within two weeks after the receipt of the specimen.

TOWNSHIP BOARDS OF HEALTH FAVORED.

THE Philadelphia County Medical Society at its last meeting adopted the following:

"*Resolved*, That the Philadelphia County Medical Society, believing that the establishment of boards of health in townships would not only afford protection to the health and lives of those living in the rural districts, but would prove an additional safeguard to the residents of cities as well, respectfully urges upon the representatives of this city in the Legislature the importance of passing the bill introduced at the opening of the session, to confer the powers and responsibilities of a board of health upon the school boards of each township, outside of cities and boroughs."

BOOK NOTICES.

TREATISE ON DIPHTHERIA. By H. BOURGIS, M.D. Geo. S. Davis, Publisher.

This volume is one of the best, if not the best, of the Physician's Leisure Library that the reviewer has seen. It contains all of the latest facts known of diphtheria at the time it was written. Its chapters on treatment can be but useful to every practitioner, while the insistence throughout the work of the bacillary origin of the disease must bring conviction to the minds of many doubters. It is a valuable addition to medical literature, and deserves a place on every physician's working table.

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A TEXT-BOOK OF PRACTICAL THERAPEUTICS. By HOBART AMORY HARE, M.D., B.Sc. Philadelphia: Lea Brothers & Co., 1894. Fourth edition.

It is unnecessary to say anything in praise of this work, which has rapidly reached a fourth edition, and has received favorable reception from the first. The new edition adds articles on some of the newer drugs, and conforms with the last Pharmacopeia in using the metric system in addition to the old system. The author still adheres to the alphabetical order of arrangement of the drugs, and we are disposed to agree with him in this. We can scarcely agree with his description of Brand's method of treating fever.

PAIN, IN ITS NEURO-PATHOLOGICAL, DIAGNOSTIC, MEDICO-LEGAL, AND NEURO-THERAPEUTIC RELATIONS. By J. L. CORNING, A.M., M.D. Philadelphia: J. B. Lippincott Co., 1894.

After looking over this book we must confess to have felt unable to discern the exact use to which it is to be devoted. Physicians will scarcely find the meagre and unsatisfactory descriptions of the diseases, which are introduced apropos of this painful character, of any practical use, and other readers would find the whole work too disconnected. In the section on the special therapeutics of pain the author introduces a long chapter on a method of his own of treating pain and functional nervous diseases by compressed air and medicinal solutions. This method has not received professional endorsement as yet, and it would seem more fitting if controversial matters were confined to journal articles.

OBSTETRIC SURGERY. By E. H. GRAUDIN, M.D., and G. W. JARMAN, M.D. Philadelphia: The F. A. Davis Co., Publishers, 1894.

This book is well written and well illustrated, but the style is too dogmatic. Were the writers men of the greatest experience and of the profoundest erudition, the style might pass unchallenged. But such is not the case. Many statements positively made are incorrect, and some of the operative technique recommended is faulty. Thus, the objection against Cesarean section before labor that hemorrhage is apt to be uncontrollable, is declared to be a myth. Some day the writers will learn the contrary by experience. The absurd argument is advanced against the use of Galbioti's knife, that, if the head is engaged in the pelvis, there is not room to pass the finger and knife between the symphysis! Who would think of opening the symphysis when the head could enter the pelvis, except in case of kyphosis? Further, the incorrect statement is made that the use of Galbioti's knife is responsible for many a urethral and vesical fistula. A superficial study of the results of the two modes of operating would have prevented this misstatement.

Again, nothing is said, in describing the introduction of the forceps-blades, about the rotation of each blade on its long axis so as to introduce it along the postero-lateral plane of the pelvis, without which manœuvre it is often impossible to insert the blades at all. On the

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whole, the student will obtain a clearer idea of the obstetric operations from the section on that subject in any of the well-known text-books than in the work under review.

ESSENTIALS OF THE DISEASES OF THE EAR, ARRANGED IN THE FORM OF QUESTIONS AND ANSWERS. Prepared especially for students of medicine and post-graduate students. By E. B. GLEASON, S.B., M.D., Clinical Professor of Otology, Medico-Chirurgical College, Philadelphia; Surgeon in Charge of the Nose, Throat, and Ear Department of the Northern Dispensary, Philadelphia. Philadelphia: W. B. Saunders, 1894.

The work, as stated by the author, is designed for post-graduate students and those attending lectures on otology. The increasing number of practitioners seeking instruction extending over a brief period of time, and the changes in our college curriculums giving advanced instruction in the "special branches," renders such a work desirable. There is a brief, but concise, description of the anatomy of the ear, which is made clearer by the system of questions and answers.

The description of instruments for examining the ears and methods of using them is sufficiently full to supplement clinical teaching. In the section on diseases of the membrana tympani we realize the difficulty of text-book teaching, and here the illustrations are below he standard maintained in other parts of the book. Again, in looking or information relative to the causation and relief of that most frequent and annoying symptom, tinnitus aurium, the student may feel that more might have been written without exceeding the scope of the work. Only passing mention is made of the removal of one or more of the ossicles as a means of relief in this condition, yet this may but serve to show the conservatism of the author.

The teaching throughout the work is clear and definite and, what is equally to the point, is safe. The book is a good one, and will find a place among those for whom it is designed.

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UNIVERSITY
MEDICAL MAGAZINE.

APRIL, 1895.

REMARKS ON THE HYGIENE OF CHILDREN,—FEEDING, SHOES, MEASUREMENT OF LENGTH.[1]

By J. P. Crozer Griffith, M.D.,

Clinical Professor of Diseases of Children in the University of Pennsylvania, Professor of Clinical Medicine in the Philadelphia Polyclinic.

Although there are several matters connected with the hygiene of infancy to which I wish to refer, the principal one among them relates to the preparation of the infant's food, and, being chief, may be considered first.

It is admitted by nearly all writers that the object aimed at in the feeding of infants upon artificially-prepared food should be to produce a milk which resembles human milk chemically, as far as it is possible to attain this end. With this in view, analyses of various milks have repeatedly been made in order to determine the relative proportions of the chief constituents,—albuminoids, fat, sugar, water, and salts. Analyses of human milk are somewhat at variance. Those of Leeds would give the albuminoids as equalling 2 per cent. Those of Meigs, Harrington, and Biedert, on the other hand, place it at 1 per cent. Adopting the latter percentage as the result of the more recent investigations, and as sustained by the greater number of authorities, we may formulate the composition of woman's milk as follows (Rotch):

Reaction	alkaline.
Bacteria	none.
Water	87–88 per cent.
Total solids	12–13 "
Fat	4 "
Albuminoids	1 "
Milk sugar	7 "
Ash	0.2 "

[1] Read before the College of Physicians, February 6, 1895.

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While there are several species of animals whose milk may be used to replace human milk, none of them produce a secretion which is sufficiently like that of woman to permit of its use without previous preparation. Consequently, none of them present any especial advantage over cow's milk, which certainly offers the most convenient basis upon which to construct an artificial human milk. The analyses of cow's milk, as ordinarily accepted, place its ingredients in about the following proportions (Rotch):

Reaction	acid.	
Bacteria	present.	
Water	86–87	per cent.
Total solids	13–14	"
Fat	4	"
Albuminoids	4	"
Milk sugar	4.5	"
Ash	0.7	"

This applies, of course, to the average herd milk. Certain breeds of cows, and, still more, individual cows, give a milk which varies from the standard. It is the albuminoids of cow's milk, and especially the caseine constituting the greatest proportion of these, which give the baby so much trouble to digest. There are undoubted chemical differences in the caseine of the two sorts of milk, and these often cause difficulties which we are unable to overcome by any method of dilution or preparation. The mere matter of quantity of the different ingredients, however, we are able to manage. If we compare the two tables given we notice that cow's milk, as contrasted with woman's milk, is much too rich in albuminoids, contains the same percentage of fat, has nearly twice as much sugar, and is slightly richer in ash. It is evident that by diluting cow's milk sufficiently we can reduce the albuminoids to the proper amount. It is also evident, however, that in so doing we diminish too greatly the amount of sugar and of fat. Our work, therefore, is clearly cut out for us, and consists in diluting cow's milk sufficiently to reduce the albuminoids to the proper percentage when the preparation is completed, and then in adding cream and sugar in sufficient amount to make up for the loss of these ingredients.

As regards the sort of sugar to be used, milk-sugar is that naturally present in milk, and it certainly seems rational, therefore, to employ it. It is possible that cane-sugar may answer just as well; and, indeed, in the case of some children it seems to agree better; but these are only the exceptions. We should certainly try by the use of milk-sugar to approach as nearly as possible to the character of human milk.

With regard to cream, it is evident that its richness must determine the amount to be employed. Ordinary skimmed cream consists of 16

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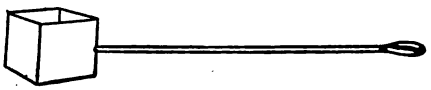
per cent. fat, while the thinner centrifugal cream contains about 20 per cent. fat. In constructing any milk mixture the character of the cream must be borne in mind, and the proportion varied accordingly. Finally, cow's milk, as it reaches the consumer, is very commonly acid, and contains bacteria, while human milk is alkaline and is free, or practically free, from bacteria. The destruction of the bacteria is to be accomplished by sterilizing or some similar process. For the removal of the acidity the addition of lime-water is very commonly employed, but a solution of soda is greatly to be preferred for several reasons. There are several objections to lime-water, and it is on account of these that, with these introductory remarks, I wish to recommend the following formula, which gives a milk corresponding, as far as possible, to human milk.

MILK MIXTURE.

Milk	1 ounce.
Cream (skimmed; 16 per cent. fat)	2 ounces.
or	
Cream (centrifugal; 20 per cent. fat)	1½ "
Soda-solution	½ ounce.
Milk-sugar	1 measure.
Water, enough to make	8 ounces.

This formula is a modification of one given by Dr. Rotch, which again was based upon one by Dr. Meigs; and that, I presume, a modification of previously existing ones. The Meigs mixture, as is well known, contains "sugar-water;" a solution of milk-sugar in water of a calculated strength. As the author himself admits, this solution has to be made fresh every few days, since it will not keep. To obviate this difficulty Dr. Rotch used a little measure, and measured out the amount of sugar—three and three-eighths drachms—required for each eight ounces of milk mixture. I have had made by a leading drug firm of this city a similar measure, which I exhibit this evening (Fig. 1). It

FIG. 1.



differs somewhat from that of Dr. Rotch in shape, but holds the same amount. Its cost is nominal and it is very convenient. In using it the sugar should be scooped up with gentle pressure against the side of the box containing it, and then levelled off. This insures the measure being actually full, without being over-filled by packing or shaking down.

The soda solution is made of the strength of one grain of bicarbonate of soda to the half-ounce of water. Analyses kindly made for

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me under the supervision of Dr. Marshall, of the University of Pennsylvania, show that the amount of this salt of soda, equivalent in alkalinity to a half-ounce of ordinary lime-water, equals very nearly one grain. A dozen packages of bicarbonate of soda, each containing one drachm, may be obtained from the druggist at very slight cost. One of these dissolved in a quart of water makes a solution of the proper strength. As the dozen packages are sufficient to alkalinize 768 eight-ounce bottles of the milk mixture, and as the soda solution will keep indefinitely, it is readily seen that the use of this solution is both cheap and simple.

We may now consider some of the reasons why a soda solution is decidedly to be preferred to lime-water. In the first place it is a mistaken idea that lime must be added to the food for the sake of the lime salts required for the baby. Cow's milk, as the tables show, is decidedly richer than woman's milk in mineral matter, including lime, and its dilution does not reduce the salts below the proper amount. The sole object of the lime-water is to render the mixture alkaline, and soda does this just as well. I hasten to say that the use of soda is in no way original with me. Dr. Jacobi, for one, long ago sanctioned it.

Another objection to lime-water is that when added to milk in the quantity sometimes advised, its taste is quite evident and may be unpleasant to the baby. Another count against it is that when the milk mixture is heated a chemical reaction takes place between the sugar and the lime and a brownish color is produced. This is perhaps only an objection on an esthetic ground, but there seems no good reason for producing the offending color unless it is necessary. A fourth and more vital objection is that when the milk mixture is sterilized after lime-water has been added, the lime is precipitated in large measure, and the desired alkalinity is reduced or destroyed.

Finally, in the effort to overcome the latter objection, the difficulties of sterilizing are largely increased. It has been proposed, for instance, that the milk, water, sugar, and cream be mixed in the proper proportions and sterilized, and that the lime-water then be added. We can only do this with safety, however, just before the mixture is to be used, since an earlier removal of the cotton plug allows germs to enter. Consequently the proper amount of lime-water must be added to each bottle when the child is about to be fed. With the varying amounts of nourishment which the baby takes at different ages it is evident that the calculation of just how much lime water is to be added on each occasion is a matter not altogether simple. It will certainly seem to the mother to add greatly to the trouble in using sterilized milk; and it must be our object to make the process as easy as possible.

With regard to the amount of cream to be employed, the formula

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given allows a certain latitude, since the cream is a variable substance. In using the mixture the whole amount needed for the twenty-four hours should be prepared in the morning when the milk arrives, the proper amount placed in each bottle according to the age of the child, and the bottles placed in the sterilizer and heated to the degree of temperature desired.

With regard to the practice of sterilizing, it is undoubtedly true that the process often in some way makes the caseine more difficult to digest. On this account Pasteurizing has been proposed to take its place, as it does not materially alter the digestibility. The studies of Koplik and others show, however, that Pasteurizing in the strict sense of the term—*i.e*, heating to 75° C. (167° F.)—is not a safe method to be intrusted to mothers, since it does not satisfactorily kill the germs, which will develop in less than twenty-four hours. On this account a modified sterilizing is to be preferred. If the sterilizer is employed with the hood removed and the lid set slightly ajar and a brisk but not too hot fire is employed for about forty-five minutes, the temperature of the milk does not go above 80° or 90° C.,—a temperature which does not materially affect the digestibility of the milk, yet which is sufficient to render the milk practically safe for twenty-four hours. I have myself tested the milk with the thermometer while it was being heated in this way.

Where predigestion of the food is to be combined with sterilizing, as is very often necessary in cases of illness, we may employ the following formula:

STERILIZED PEPTONIZED MILK MIXTURE.

Water	8 ounces.
One-half of a peptonizing tube	
or	
One peptonizing tablet	
Dissolve.	
Add milk	8 ounces.
Peptonize.	
Then use,—	
Peptonized milk	2 ounces.
Cream	1½ to 2 ounces.
Milk-sugar	1 measure.
Water enough to make	8 ounces.

Sterilize as already described.

This formula contains the same proportions as the preceding one, with the exception of the soda, which is increased in amount. No soda solution need be added, since the soda in the peptonizing powders or tablets more than takes its place.

In concluding remarks upon feeding, I beg leave to exhibit this food warmer, which will be found very convenient, and which is not as

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widely known as it deserves. When a baby wakes in the night crying for its bottle, the tedious warming of the milk to the proper temperature is, to say the least, a dreary process. This food-warmer, called the Penniston, consists practically of a hot-water bag with an outside pocket. One or more bottles of prepared milk, sterilized and corked, may be placed in the pocket on retiring, the compartment for water filled, and the whole covered with a woollen cloth. The bottles are thus kept ready for immediate use.

To change the subject altogether, I desire to call the attention of the College to the importance of proper foot-covering for children. Almost always shoes are improperly made. It is often supposed that a baby's foot, because plump and well rounded, is therefore shapeless. Attention has been called to the proper shape of the shoe by various writers, but, although the interest of many mothers is awakened, that of most shoemakers is still dormant. Shoes are constantly seen which clearly are cramping the baby's toes, with the natural result of pro-

FIG. 2.

ducing ingrowing toe-nails and the like. In the effort to incite needed reform in this direction, I have made a considerable number of foot tracings of children of different ages, some of which I would exhibit to the College. (Fig. 2.) They were prepared by painting the sole with a mixture of lamp-black, turpentine, and sweet oil, and then pressing it upon a piece of blotting-paper. They serve to show better than any words can tell that a child's foot, even at a very early age, is, of course, of the same shape as the adult's. The conclusion naturally drawn is that the earliest shoes should be rights and lefts. I came across a shoemaker in London who does make infants' shoes of this shape properly conformed to the foot. Unfortunately he is such an enthusiast that he goes to extremes, and produces a shoe which, excellent as it is, is not pretty, and can consequently not hope to find a sale, in this country at least. I purchased a pair from him, which I present for your inspection. After submitting a number of foot-tracings to a leading shoemaker of this city, I have received the promise that shoes will be kept in stock which are rights and lefts, and which are

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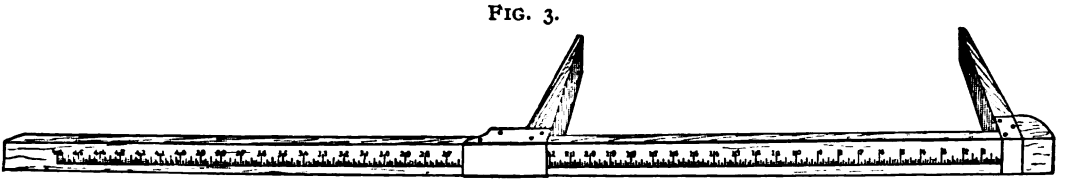
conformed as far as possible to the shape of the feet of children, even of the youngest age at which shoes are needed.

In concluding these remarks upon various matters relating to children, I may call attention to the importance in many cases, as well as the scientific interest, of knowing how rapidly any baby is increasing in length. The determination of weight is simple enough, but the holding and measuring of a child against the wall is an awkward and inaccurate method for measuring its length. I wish to exhibit to the College this apparatus which I have devised to facilitate the measuring. (Fig 3.[1]) There is absolutely nothing original about it, and the same device has probably been employed repeatedly by others, although I

FIG. 3.



have not happened to meet with a description of it. It is, as you see, similar to the foot-measures used by shoemakers, but much enlarged. It is four feet in length, and the pieces which run transversely to the length are eight inches long and are lined with felt. To use it the baby should be laid on its back upon a firm mattress. The end piece can then be placed above the head and the sliding piece moved along until it touches the foot, both toes and heel. The apparatus can be constructed by any clever carpenter. It can easily be made to fold into a comparatively small space to be easily portable.

ICHTHYOL IN THE TREATMENT OF ERYSIPELAS.

ZELEWSKY has found ichthyol efficacious in every form of erysipelas, and in his opinion it is superior to other remedies. In some cases of migratory erysipelas affecting both sides of the patient's body, he painted one side with Trousseau's solution (acidi tannici, camphoræ, āā 2.0 grammes,—31 grains; æther. sulph., 15.0 grammes,—3¾ fluidrachms) and the other with ichthyol, the morbid process subsiding much more quickly under the latter treatment than under Trousseau's solution. He prescribed the drug as follows: Ammon. sulpho-ichthyol, spir. æther., āā 1 part; collodi. elastici, 2 parts.—*Iugno-russkaya medic. gazetta.*

[1] The cuts appearing in this article have been electrotyped from plates made for Dr. Griffith's new work, "The Hygiene of Infants," and kindly loaned by Mr. W. B. Saunders, the publisher.

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CONCERNING TEST-TYPE.[1]

By B. Alexander Randall, M.A., M.D.,

Ophthalmic and Aural Surgeon to the Children's Hospital; Professor of the Diseases of the Ear in the University of Pennsylvania and the Philadelphia Polyclinic, etc.

Innumerable test-types—good, bad, and indifferent—have been presented by many ophthalmic surgeons and perpetuated or travestied by numerous opticians, so that any one desirous of having an accurate measure of his patients' vision will have much apparent room for choice and have to look far for a satisfactory publication. The name inscribed upon a test-card is no guarantee that it has met the approval of that ophthalmologist, since its use has often been unauthorized, as the writer knows to his personal cost. One who wishes a chart which is really correct must know the principles and practice of test-type construction and apply them to his own or other cards.

These principles are simple and their application easy; and it is a great pity that so much ignorantly or perversely erroneous work has been put forward. Empiricism in these tests gave place to scientific experiment and demonstration when Snellen utilized the data obtained by Helmholtz and other physiologists in measuring the minimum visible, and constructed letters subtending at definite distances an angle of five minutes, and with parts and interspaces one-fifth of this height. He adopted the Roman block-letter as fairly satisfying the conditions of science and practice; and most of the deviations later made from his standard have been for the worse.

This *one-minute* standard was gained by tests with gratings of rods of equal widths and interspaces, which were found to be discernible by the normal eye if subtending an angle of about fifty seconds. This does not mean that one or perhaps several wires or rods cannot be distinguished under a far smaller angle, or that points of light like stars must have an appreciable breadth to be perceived. The test rests upon the well-ascertained fact that for accurate and ready recognition of the letters, their strokes and interspaces must subtend about one minute, since the parts have never the considerable length which makes wires distinguishable under a smaller angle. And, further, it has been found that when circular dots are used as test-objects, about a half dozen being grouped irregularly with interspaces equal to their breadth, a much larger angle, more than two minutes, is requisite.

Snellen chose the "block Roman" capitals for his test-letters, and undertook to inscribe each in a square subdivided into twenty-five

[1] Read before the Ophthalmic Section of the Philadelphia College of Physicians, December 18, 1894.

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one-minute spaces. He exaggerated the broadening of the foot and other adnexa of the letters,—additions which have their *raison d'être* in combating the effect of irradiation in apparently reducing the size of extremities not thus reinforced,—as shown in Fig. 3. Some of his letters are perfect in their exemplification of the principle, as the E (Fig. 2); but the A and H had to be broadened to seven spaces in order to have one-minute interspaces, and even then remained difficult letters to decipher (Fig. 1). His gradations in the sizes of the letters were rather violent and disproportionate, although fairly meeting clinical needs.

An improvement was attempted by Dr. John Green, of St. Louis, in working out a more evenly progressive series of sizes, in which each line was on a scale of 0.795 of the preceding; but he used the simple Gothic letter without foot or other adnexa, which constitutes a far easier test-object than the block Roman, since its interspaces are always more than one minute. Hence, Wallace has put forward a four-minute letter as a truer empirical standard, as shown in Fig. 6. Later Green adopted a new letter having, as a rule, adnexa of one-half instead of

FIGS. 1 2 3 4 5 6.

one-minute dimensions. This furnishes these parts of a size adequate to fulfil their intent and to complicate sufficiently their recognition, while inconspicuous enough to hamper little the employment of almost any letter of the alphabet. While not wholly free from objections, this letter has fewer drawbacks than Snellen's, and it is a pity that it has not been more generally adopted. (Fig. 4.)

Drawn in this or in any other way, there will always be much difference in the legibility of the various letters. I and J will be so much the easiest as to exclude them from use,—B, K, and R will be among the hardest. Yet it is very important that no very limited selection shall be alone employed, since they are too easily learned; while the real test consists in showing that the patient can distinguish intervals and strokes of one-minute size in any direction, as proved by distinguishing Y from T or V, F from P, and C from G or O. As to these last letters, they should be excluded as too easy in their general rounded form, unless offering just this element of small contrast. Yet the mere break in the side does not constitute the full difference between C and O,—the former needing its upper stroke to complete it (Fig. 5); so a patient seeing the broken circle offered by some test-cards is equally incorrect whether he calls it O or C, for it is neither.

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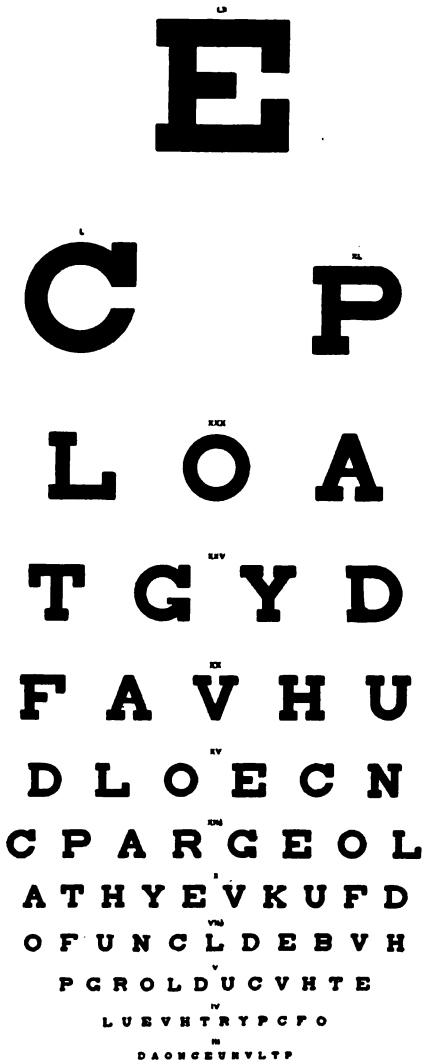
Dr. Dennett has worked out a card which employs most of the letters and well succeeds in equalizing their recognition by reducing the easy and enlarging the difficult from the accepted five-minute letter; yet the employment of the Gothic form leaves them too empirical and imperfect exponents of the one-minute principle.

FIG. 7.



The card presented by the writer some ten years ago followed Dr. Green's work closely as to the form and series of the letters, holding to the VI-metre distance for testing. So many seem to be using other distances now that it seems no longer well to keep this rather awkward convention. A more decimal series has been adopted, therefore, with close maintenance of the proportional sizes of the letters. The chart (Fig. 7) now contains sets subtending the standard angle at distances of LX, L, XL, XXX, XXV, XX, XV, XII$\frac{1}{11}$, X, VII$\frac{1}{11}$, V, IV, and III metres. The more-used lines XII and lower, contain ten or twelve letters each, so that a full test of the patient's vision can be made with small element of chance; no letter unless the N offers too difficult a task, so that the deciphering of every letter of a line should be insisted on. As normal eyes have usually more than a bare $\frac{5}{V}$ vision in good light, the V-metre line will remain a good standard for those who prefer to adhere to the six-metre distance,—none of its letters being really as difficult to decipher as some of the imperfect letters of Snellen's VI. The order of the letters has been carefully adjusted so as to bring the confusion-letters into some alternation; while the easier ones have been

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placed at the first of the line, that the patient may begin correctly and thus indicate at once which line he is attempting. The larger letters have been placed as usual at the top of the card, since no advantage has been found in the inverted arrangement. On the contrary, when illuminated by daylight, as is more common, the best sky-light falls on the bottom of the card, where nine-tenths of our work is done among the smaller letters. The color of the card has some importance; a cream-color verging on the India-tint giving better definition through lessening of irradiation, as is easily seen on comparing a new with a time-stained card. The delineation of the squares in which the letters are inscribed has a value as an object lesson to those ignorant or forgetful of the principle of construction, and as a demonstration of its due employment in the card in hand. For the larger letters it is unobjectionable, but at or below the XII line it begins to encumber the letters and detract from their clearness. It should be omitted in the lower half of the chart therefore; but I regret that in the present card it has been wholly left out, through a mistake.

It may seem invidious to point out the advantages of these types by showing the shortcomings of others; but the illustrations offered may suffice to indicate those which I have sought to avoid. Other tests have value, often great; yet I believe these will be found to better answer the scientific and practical needs. Strange as it may seem, the majority of publications do not afford the accurate dimensions of the letters, being based upon the tangent of the angle $5^1 = .001454$, instead of twice the tangent of half the angle $= .001425$. Slight as is this difference, it makes the letters for LX metres 87.24 millimetres, instead of 85.5 millimetres in height; so they really subtend the standard angle at 61.22 metres. All too often, through the carelessness of author or publisher, the errors are still more conspicuous.

Frequency of Biliary Calculi.

Halk (*Bibliothek for Läger*, p. 511, 1893), in a series of 414 autopsies upon patients between 50 and 90 years of age, found biliary concretions in 29 per cent., the percentage in the female being 40, and in the male 19. In 112 cases the stones were lodged in the gall-bladder alone, in three cases in the bile-ducts or intestines as well, and in four cases in the ductus choledochus only.—*The Universal Medical Journal.*

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A DESCRIPTION OF SOME OF THE MOST IMPORTANT OPHTHALMIC METHODS EMPLOYED FOR THE RECOGNITION OF PERIPHERAL AND CENTRAL NERVE DISEASE.

By Charles A. Oliver, A.M., M.D.,

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(Concluded from page 395.)

Objective Study of Motor Conditions.

Leaving the methods for the recognition of the sensory disturbances, the observer is brought to what at first sight seems one of the easiest portions of the examination,—that is, the objective study of the motor conditions of the visual apparatus. The muscular movements, however, are so varied in monocular and binocular fixation, and the association of nerve action is so complex in the different physiological acts of the two organs, that the examiner must be mentally well equipped to fully understand the significance of what to the uninitiated may appear to be an indeterminate commingling of movement and action.

Most important are the procedures for the determination of iris movement. The comparative sizes and shapes of the pupils should first be gauged, the former being accomplished by one of the many forms of pupillometer, and the latter by the use of a twelve- to sixteen-diopter convex lens in the sight-hole of an ophthalmoscope. Should the pupil be round, as it seldom is, the horizontal width should be carefully estimated in millimetre lengths. If the pupil be oval, the lengths of the long and short axes should be determined, and the degree of direction of the long axis should be noted. These determinations are to be made during both monocular and binocular exposure, whilst the eyes are gazing directly ahead at a distance, and whilst they are fixed upon some near object, situated at about thirty-five centimetres' distance from the patient's face. This should be done both immediately in front of the singly-exposed organ and on the median line when both eyes are simultaneously exposed. The patient should be made to face a window or some other source of diffuse daylight. If artificial light be employed, a ground glass shade over the source of illumination will be conducive to better results.

The significance of the size of the pupil itself, although frequently unlike in the two eyes of the same subject, may often be taken advantage of for diagnostic purposes. For example, in myopia it is, by reason of relaxation of accommodation and consequent want

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of impulse of the sphincter muscle of the iris, as a rule, larger than ordinary. It is also large in most of the various forms of so-called amblyopia and amaurosis. In sympathetic irritation, as may be found in the earlier stages of aneurismal pressure on the nerve, it is large. In paralysis of the third nerve, in glaucoma, cerebral compression, neuroses of functional type, peripheral irritations, it generally becomes dilated. Local application and internal administration of certain drugs, ordinarily known as mydriatics, cause it; moreover, it must be remembered that it is larger in childhood and in youth than it is in adult life and in old age. On the contrary, it is small in hypermetropia. Especially is this so in cases where the patient is continuously using the eyes for close work. In retinal hyperesthesia, in meningeal inflammation, in cerebral irritation, and in certain stages of convulsive seizures, it becomes contracted. It lessens in size during the local and general action of certain drugs popularly known as myotics. Decrease of the area is an almost certain accompaniment of increasing age. Frequently, as is so often seen in the early stages of posterior spinal sclerosis and general paralysis of the insane, it will be found to assume all manner of bizarre shapes and irregularities of size.

All of these conditions should be noted most carefully.

For the better differentiation of pathological or artificial pupillary disturbances, some one of the numerous mydriatic and myotic agents, such as cocaine, atropine, eserine, etc., can, at times, be employed to advantage.

Having thus roughly determined the equilibrium of the iris series of muscles, the actions of the sphincter muscles of these membranes are next to be studied. As these movements are associated ones, the procedures for their determination must be made under definite conditions. The first and the most important impulse or reflex-act is that known as iris-response to light stimulus thrown upon the retina. To study it properly, the patient is made to face some source of diffuse daylight or artificial illumination. He is then to be directed to keep both eyes open and to gaze directly ahead into space. The two organs are then to be covered and alternately exposed to the entering light stimulus until surety is made that there is muscular response or not. If there be any response, it will evidence itself by a more or less complete contraction of a portion or of the entire pupillary area upon exposure of the organ to the source of light. Frequently, in neuroses of degenerative type, a series of slowly-decreasing secondary clonicisms may be noticed. These can be best studied by a magnifying lens which has been preferably placed behind the sight-hole of an ophthalmoscope.

The next so-called pupillary reflex act, or better, iris reflex act, to study, is that existing between the ciliary and the iris muscles. Either of

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these muscles, as can be determined experimentally, contracts its fibres when its fellow is brought into play. When the reflex movement of the iris, producing pupillary contraction, is brought into action by the contraction of the ciliary muscle so as to allow the lens to increase its power of focussing for near vision, the impulse is known as pupillary response to accommodation. To determine whether this reflex motion is in proper working order, one eye is to be covered from use and the other is first made to gaze directly ahead at a distance. When the pupil of the gazing eye has become comparatively fixed in size, an object, such as the finger-tip or a pencil-point, is to be quickly placed at about thirty-five centimetres in front of the exposed eye, and the patient is requested to look directly at the object. If the reflex be in proper working order, the pupil will immediately contract, to dilate when the fixation-object is removed and the eye is made to regaze into space.

A third pupillary response (better, iris response) is where the two eyes are made to accommodate synchronously upon a near object, situated upon the median line. Here, in addition to the relationship of impulse between the ciliary and the iris muscles, there is another factor, known as simultaneous contraction of the internal recti muscles, added. This compound reflex act, which is ordinarily, though improperly, known as the pupillary reaction to convergence,[1] is obtained in exactly the same way as it was during the previous method, except that here the fixation object is situated upon the median line and both eyes are coetaneously exposed.

A fourth response is that in which the pupil dilates when the skin of the back of the neck is pinched. By some it is known as Parrot's sign, and is said to be present in some cases of meningeal inflammation.

All of these examinations should be repeated frequently, often, —taking care in many cases to totally withdraw any form of stimulus from the eyes by temporary bandaging of both eyes,—until certainty of result can be vouchsafed. This cannot be too strongly insisted upon, as nowhere in all of the methods of ocular precision, when the reflexes are carefully or properly studied, can so much information be gained as to deep-seated nerve and vascular disorder of motor type as in these most delicate and evanescent tests.

One of the most important methods of diagnosis is that known as the hemianopic iris inaction sign, or what is popularly known as the Wernicke sign. Here, by the study of the peculiarities of movement of the iris in certain types of hemianopsia, much localizing data can be had as to the position of intracranial mischief. As is well known, the reflex arc for iris movement, when light stimulus is thrown upon the

[1] It would be more fitting to say iris reaction to convergence, as the pupil, being a void, cannot have a reaction.

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retina, extends back along the in-going optic nerve-fibres, until when about in mid-brain it associates with the out-going motor nerves of the iris. This, as has been proven anatomically, takes place before the position of the corpora quadrigemina has been reached. This being so, it is certain that, should some break occur within this reflex sensory-motor loop back of the optic nerves themselves,—that is, in the optic chiasm or in the optic tracts,—the want of proper physiological act to any appropriate external stimulus would immediately manifest itself by a failure of response of iris movement, should light stimulus be thrown through the pupil upon the retina. Knowing these facts, so here in hemianopsia, or, in fact, any related field defect, should the lesion be situated in the chiasm or optic tracts anterior to the corpora quadrigemina, the iris muscle will fail to respond when light stimulus is carefully thrown upon the non-receiving portions of the retina.

To produce the symptom satisfactorily, many plans have been urged. In the writer's experience, the easiest and most practical method consists in simply having the patient placed in the ordinary ophthalmoscopic position, except that the source of light is so situated that the rays will come from over his head. One eye should be tried at a time, it being made to gaze straight ahead into a darkened space. The fellow eye is to be excluded from the entrance of all rays of light into it. The observer, standing in front of the patient, is to faintly illuminate the iris that he wishes to study by means of a piece of plain looking-glass such as is employed in the fundus-reflex test. This can be done by some permanent arrangement of mirror or by holding a glass in the hand. An ordinary concave ophthalmoscopic mirror is to be held in the other hand and a narrow beam of concentrated light is to be thrown upon the pupil, from the periphery of the blind area of the field of vision. This beam is then slowly moved in towards the position of the line of fixation. If the sign be present, there will not be any iris movement until the edge of the retained field area has been reached. At this point, an immediate pupillary contraction will take place. This contraction will persist as long as the light stimulus is kept within the persistent field area. Should the lesion be situated posterior to the corpora quadrigemina, pupillary contraction will ensue, even though the stimulus be presented from the blind portion of the visual field, thus showing that the motor-sensory arc is untouched and unharmed.

Another sign, known as the Knies pupil-symptom, is well worth searching for. It consists in a hemianopic inaction without a hemianopic field-defect, and shows that there is some localized disturbance in the different pupillary reflex path between the third-nerve nucleus of one side and its related tract. In some cases of grave nerve-disease,

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especially where there is coexistent pupillary dilatation, and no answers can be obtained from the patient, much valuable data as to the condition of the ciliary muscle can be objectively obtained by the so-called catoptric test. As is well known, if a small beam of extraneous light be allowed to fall very obliquely upon the pupillary area, and this area be properly magnified and looked at, three images of the beam will be plainly seen. These images, in their order of succession, are formed upon the anterior convex surface of the cornea, the anterior convex surface of the lens, and the inner concave surface of the posterior portion of the lens. The first two images are large and upright, whilst the third image is small and inverted. In the act of accommodation, which necessarily means a contraction of the ciliary muscle, the convexity of the lens increases. This increase in the strength of the lens shows itself by a separation and a change in comparative size of the lenticular reflexes. The lenticular reflex, which is the second reflex seen in the test, becomes larger and slightly moves anteriorly. The posterior lenticular reflex, which is the third reflex of the test, becomes smaller and markedly recedes posteriorly.

At times, when the pupil is small and when it is impossible to properly study the catoptric images, the plain mirror can be employed to advantage to determine the degree and the amount of accommodative action of the ciliary muscle. If, whilst the instrument is being used to study the play of the movements of the lights and shadows in the fundus-reflex test, it be gradually approached to the patient's eye, there will be a point that is dependent upon the degree of accommodative power possessed by the organ, at which the movements of the reflexes will be reversed. This point, measured from the anterior surface of the eye, will determine both that there is ciliary muscle action and its degree of power.

The objective study of the equilibrium, and the determination of the visible motions of the extrinsic muscles of the two eyes, next demand attention. In many instances, principally in the incipient and in the irritative stages of nerve-disease, the recognition of minor degrees of disturbances of these muscles is extremely difficult. Hidden from view, associated in the most complex way in their normal actions, and so readily compensated for among themselves in their faults, their peculiarities of balance and the disturbances of their action are much less readily recognized upon mere inspection than the peculiarities of their related interior groupings.

Often, however, a quick observer may notice abnormalities of facial expression, and take advantage of peculiar movements of the head and trunk muscles when certain ocular motions are attempted. Should the patient complain of double vision, one eye will often be found unable

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to fix upon some object held at about occupation distance (such as reading or sewing) upon the median line. The clinical demonstration of this sign, which can be very readily determined by alternately excluding one of the eyes whilst its fellow is made to gaze at an object, such as a pen-point, held directly ahead of the patient at about thirty-five centimetres' distance, is ordinarily known as the method by exclusion. If desired, the degree of deviation of the faulty eye can be estimated by the aid of a strabismometer, held in front of each eye. This experiment can be repeated in any meridian of the field of vision that may be desired. In fact, if due allowance for situation be taken, it may be tried in any position of muscle equilibrium that may seem to be desirable. Again, the degree of rotation, effected by the globe and the character of the movement when the eye is made to follow the upraised finger, is of the greatest importance as an objective test. If there be an irritated or hypertrophied muscle, the movement of the eyeball in the direction of the muscle will be greater than the movement of the opposite eyeball in the direction of the corresponding muscle. Should there be a paresis of the affected muscle, the movement of the globe to which it is attached will be limited in the direction of the pull of the muscle. An excellent routine in the determination of these conditions is to first consider the monocular movements in the horizontal meridian. This is to be followed by a study of the movements in the vertical meridian and at oblique angles. These observations should be repeated with the two eyes simultaneously, taking care in all instances to add the associated physiologic movements, as, for instance, the two interni in maximum convergence and the related external and internal groupings in conjugate deviation. If these tests be properly and intelligently conducted, they will often, especially if the observer be quick and certain in his finger movements, bring to light many minor discrepancies of both peripheral and central type that otherwise might escape attention.

Watch should be made for slight ataxic movements during extreme action of the suspected muscle. Here the eyeball seems to successively recede several times back along its excursional route and regain for a second or two its point of limitation of movement, before being able to accurately and steadfastly fix upon the observer's upraised finger.

In all of this work, it should be remembered that the degree of movement in different directions of any two or more groups of muscles is greatly at variance, not only in respect to the individual strength of the muscles, but also as to the physiological acts that are being required of the muscle-grouping at the time of action. For instance, the lateral movements of the globes, both separately and combinedly, are

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far greater than the vertical, whilst the utmost degree of the movement of the two interni during the effort for binocular convergence is far less, especially in hypermetropes and in old subjects, than it is when these muscles are separately employed in association with the externi during conjugate deviation. Again, the observer should remember that errors of refraction may so mask the apparent results of the most carefully performed work that, at times, the most bizarre and seemingly incongruous findings may be obtained. For this reason, therefore, no tests for muscle-balance and motion, unless so marked that they cannot be mistaken by the merest novice, should ever be undertaken until all or as much refractive error as possible has been expunged.

If the observer be an adept in the art of ophthalmoscopy, and knows so well how to handle the instrument that it offers no inconvenience in any way, or even if its use in this particular connection is repeated sufficiently often until all technique has been thoroughly mastered, the presence of muscular deviation may often be objectively decided. To do such work properly, the patient is to be seated in the ordinary ophthalmoscopic position. The light is to be placed directly over and back of his head. The observer is to stand directly in front of the patient and to face him. The patient should now be made to gaze steadily at the sight-hole of the instrument or the forehead of the observer. The observer is to gaze alternately at the two eyes of the patient and study the relative situations of the bright light-reflex upon the patient's corneæ. The feeblest nystagmic motions may ofttimes be brought to view by recourse to one of these methods. If the mirror be not at hand, a candle-flame so shaded from the observer that it does not interfere with the sight of the patient's corneæ, may be substituted. This latter plan, although somewhat more difficult and necessitative of more practice, has several times served the writer at the bedside.

A spasmodic action of the superior elevator muscle of the upper lid, known as Abadie's sign, may, at times, be distinguished in cases of Basedow's disease. Poisoning of the palpebral fissure, described by Jacobson as sympathetic ptosis and probably due to paralysis of the sympathetic, may appear during the course of posterior spinal sclerosis. Imperfect action of the orbicularis muscle with pilullary movements dependent upon a minor degree of facial palsy, which has been called attention to by Berger as appearing in the same disease, should be sought for in suspected cases.

At times, in exophthalmic goitre, the upper lids lag when the eyes are made to direct their gaze downward. This, known as the "von Gräfe sign," has, in the hands of the writer, been the easiest recognized, whilst the patient is made to lie flat upon his back, with his head slightly elevated and inclined forward upon a firm, hard pillow.

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While the patient is in this position, he should be made to gaze with his two eyes at the observer's finger-tip, which is to be held at about seventy centimetres directly above the patient's face. The observer is then to slowly move his finger in a curvilinear direction towards the patient's breast. If the sign be present, the upper lids will lag, whilst the eyeballs will follow the finger. Dalrymple's sign, or Stellwag's symptom, which consists in an abnormal widening of the fissure between the lids, can often be seen in the same disease.

In some instances, a valuable clinical guide as to the degree of smoothness and evenness of the movements of the extra-ocular muscles through their tendinous sheaths and coverings, can be obtained by the employment of auscultation. The writer has sometimes felt that he has thus added an additional diagnostic factor in so-called muscular paralyses that later have been found to have been mere mechanical impediments to muscle-action. This he has several times observed in cases of rheumatism and gout.

Subjective Study of Motor Conditions.

The last grouping of studies of the motor series of ocular symptoms (the subjective motor) is in reality the most vague, and frequently the most confusing. Here, not only must the answers depend upon the patient's assertions, which often are the sequences of incomprehensible questions to his uneducated mind, but frequently, especially in the seriously ill and the mentally unfit, the apparent results are useless and valueless. When properly obtained, however, and fortunately, as a rule, in subjects whose disease is in its very incipiency, the results are most valuable. Brief training of the patient with a couple of the procedures, and explanation of what is to be expected in a few of the easiest methods, before any attempts at examination are made, have, in the writer's experience, saved much subsequent useless labor upon his part, and given answers that have been eminently satisfactory.

Commencing with the easiest and the most easily comprehended, the plan for the determination of the disturbances of the extra-ocular muscular groupings will be taken first. The muscles should be tested both when they are used to fix the eyes upon near and when they are made to have them gaze upon distant objects. In every instance, care must be taken to note the circumstances under which the test is being performed. Taking the study of the deviations where the eyes are gazing at a distance first, the simplest and easiest plan to render any disturbance apparent, and one which can be accomplished without the employment of any delicate or complicate apparatus, is to have the patient placed in a darkened room. He should then be made to gaze at a minute point of light, situated at about five metres' distance from

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his eyes and upon a level with them. A ten-degree prism, base up or down, is next to be placed before one of his eyes. Preferably, as a routine, the left eye should be the one chosen. The relative positions of the false light thus produced and the true one are then to be ascertained. For example, if the prism be placed base up before the left eye, the false image thus produced and seen by the left eye, will be thrown below the true light. Should the inferiorly-situated false light be also thrown to the right, there is, by reason of the left false light having been crossed over to the right of the true right light, a condition known as crossed or heteronymous diplopia. This shows that the patient has either an enervation of the left internus muscle or a spasmodic contraction of the right externus muscle. So, similarly, with any series of muscles, the position of the false image as compared with the true one will always give immediate and almost certain answer as to the character of the fault and the determination of the muscle that is disturbed. These obtained, the degree of apparent variation can then be readily determined by the superposition of increasing strengths of correcting prisms with their apices placed towards the supposed affected muscles.

Should the false light, when the prism is placed either base up or down before one eye, appear upon the side towards the eye before which the prism is placed, the double vision, or diplopia, as it is termed, would then be known as homonymous. If, under the same circumstances, the two lights be situated immediately in vertical line, there is said to be orthophoria or perfect binocular equilibrium in that meridian. If desired, a gauged card can be substituted for the correcting prisms, and the amount of apparent deviation can be readily designated by the patient. To assist in the determination of the relative positions of the two images, the true one can be made to appear as "red" to the patient by placing a piece of plain red glass before the eye that has not any prism before it, thus more readily differentiating it from the false one that has been produced by the prism-bearing eye.

In vertical deviation obtained by horizontally-placed prisms, the prism-strengths must be necessarily greatly increased. This is so, by reason of the preponderant powers of the lateral muscle-groupings over the vertical muscles to overcome stronger prisms. In this series of experiments, the faulty findings are to be estimated by vertically-placed correcting prisms. If, during such experiments, a tendency for vertical deviation of one of the visual lines be found, hyperphoria is said to exist.

Another rough and ready test for the determination of muscle-balance that is peculiarly applicable to the sick-room is what is known by Duane as the parallax-test. After having placed the patient and a

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distant light upon a proper level, he is to be requested to alternately expose the two eyes whilst he endeavors to steadfastly gaze at the light. If muscle-balance exists, the right and the left image of the light will not apparently undergo any movement. If any muscular deviation be present, the images of the lights will appear to jump into a new position the moment that the covered eye is exposed. If desired, the degree of muscle disturbance can be easily estimated in this test by means of correcting prisms.

With properly-constructed apparatus, the tests for the determination of muscle-balance become more beautiful and more certain. Commencing with the simplest,—the glass-rod test of Maddox,—much important data, especially from previously instructed and intelligent subjects, can be obtained. The contrivance essentially consists of one or more short cylinders of clear glass that distort the image of the light into one or more lines that are situated at right angles to the direction of the placing of the rod. The image of the lines is so different in outline and shape from the untransformed image of the light as seen with the opposite naked eye, that it cannot be confounded or fused with the undisturbed image of the fellow eye. Consequently, if no impulse for fusion exists, the muscles of each eye will assume their individual state of equilibrium. This is immediately shown by the relative positions of the projections of the two series of images. Should any deviation exist, its angle and its degree can easily be estimated, just as in the previous test, by the addition of the prismatic strengths that are necessary to superimpose the lines exactly upon the untransformed candle-flame.

If the patient can be seen at a consultation room, where more delicate contrivances can be employed, some one of the better grade photometers and revolving prisms, such as Prince's, Risley's, Jackson's, or Stevens's, may be used. Where greater delicacy or where scientific accuracy is necessary, some more complex and more expensive contrivance, such as Brayton's optomyometer, may become useful.

The above-mentioned simpler tests, when used in their various forms by an accurate observer, can hardly fail to elicit adequate data as to almost all forms of muscle discrepancy, after sufficient repetition and due explanation have been given to the patient. In many of the grosser and more marked cases, the mere superposition of a plain red glass before one of the eyes will be all that is necessary to study the kind and the degree of diplopia.

In numerous instances, the writer has found that it is a good plan to estimate one faulty meridian, as, for example, the horizontal, and then, after this has been corrected, to search for any disturbance in the opposite meridian and to estimate this. By this plan, the combined

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correction frequently evinces a less difference of necessary strengths in each of the two meridians than would be found were they to be separately estimated. This should always be remembered, as it is a plan of procedure that may be of the utmost etiological importance and even of subsequent therapeutic value in special cases under study.

Another method that may at times be adopted, is to estimate the amount of prism-deviation that the different extra-ocular muscles can overcome. This is done by having the patient look at a distant light with his two eyes, and then substituting stronger and stronger prisms before one eye with their apices pointed towards the muscle of that eye which is desired to be studied, until double vision is complained of. As a rough guide, the internal rectus muscles are said to generally overcome about forty to fifty degrees of prism strength; the external rectus muscles about eight degrees; the inferior rectus muscles about four degrees; and the superior rectus muscles about three degrees.

In all cases, the subjective determination of the degree of the power of the ciliary muscle, thus evidencing the amount of consequent lenticular action, is necessary. To do this properly, one eye should be tried at a time. It is always best to commence with the supposed more affected one. A series of small test-words are to be first approximated so closely to the patient's face that he cannot recognize any of the type. By now slowly moving the card away from the eye, the distance of the point of the first correct naming of the letters or spelling of the smallest words upon the card away from the eye is to be noted in centimetres. This distance or measurement gives the near point or punctum proximum (p.p.) as it is termed. This represents the utmost strength of the accommodative or focussing apparatus of the eye, and shows the amount of action of the ciliary muscle. After this has been registered, the card of type is to be removed beyond the limit of distinct vision for the same size of letters that has been used to obtain the near point. The letters are then to be slowly approached towards the patient's eye until another similarly-sized word or combination of letters is correctly read. This gives the farthest point, or the punctum remotum (p.r.). The two series of findings are to be noted in the following manner: for example, "Acc. (accommodation) = type 0.50 D (the size of one series of letters), 20–35 c.m. (centimetres)." Where presbyopia is supposed to exist, or where there are high and extreme degrees of ametropia, the superposition of correcting lenses, taking care to specify them in the notings, should be employed to enable the patient to read the test-words.

In addition to these four varieties of procedures for the determination of the motor and sensory symptoms of the visual apparatus, the observer should never fail to obtain a clear and a concise history of any

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pre-existing and present ocular symptoms. A brief record of the gross objective condition of the organ should be noted. The deeply-seated and the more superficial vascularity of the sclera and overlying conjunctiva should be studied. Fatty degeneration areas around the periphery of the cornea should be searched for. The state of the lacrymal apparatus should be determined. Marks of inflammatory thickenings, and the degree of intra-ocular tension, should both be recorded.

If to these the relative prominence of the eyes be gauged, and palpation and auscultation be practised for the detection of orbital bruit, the work will be more complete. At times, it must be remembered that patients may either intentionally or unwittingly feign certain ocular symptoms. The determination of the truth or falsity of their assertions can be accomplished by experiments and procedures which are intended to either actually deceive or confuse the patient. Plans of all kinds, dependent upon the ingenuity of the examiner, can be tried for this class of subjects.

In parting, the writer can give no better advice to the reader than to study every ocular symptom that may appear of importance to the elucidation of the cause of any related neural disturbance. The examiner should understand that it is the entire grouping of the ocular conditions that alone can furnish proper data. This must be done repeatedly and sufficiently often to allow an understanding of the course taken by the symptoms, and to formulate some generalization as to their significance. In fact, if in all of his work the reader should constantly employ the most careful and painstaking technique, and exercise proper judgment as to the meaning of the findings, he will soon realize that the reputation and certainty of his results will far more than repay him for his trouble and his care.

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THE SPINAL CORD LESIONS AND SYMPTOMS OF PERNICIOUS ANEMIA.[1]

By Charles W. Burr, M.D.,

Clinical Professor of Nervous Diseases in the Medico-Chirurgical College; Pathologist to the Orthopedic Hospital and Infirmary for Nervous Diseases.

The following study is based upon seven cases of pernicious anemia, a case of profound anemia secondary to chronic dysentery, and one of ataxic paraplegia occurring in a phthisical subject with intense anemia. I shall discuss the frequency of lesions in the spinal cord, their localization, their causation, and the symptoms they produce. I shall not consider at all the hemorrhages that sometimes occur in the cord, since they bear no relation to the lesions found in my cases.

Case I.[2]—(Courtesy of Dr. Morris J. Lewis.) Many of the notes have been lost, and I am only able to give the report of the patient's condition on admission to the Infirmary in November, 1889. Middle-aged white woman; bedridden; skin sallow, with a peculiar yellow tinge; no dark spots; pressure causes no change in color. Her body has a peculiar musty odor. Spleen not enlarged; area of renal dulness not increased; lungs normal. Apex-beat is in the fifth interspace in nipple line. The impulse is a trifle extended. A systolic bruit is heard over the body of the heart and at the apex, at which point it is loudest. It is perfectly soft and low. There is a venous hum in neck. Slight general edema. The veins in the arms are not very marked. There is no tenderness over sternum or clavicle. The back is very tender to touch. No periosteal nodes are found. There are no glandular enlargements in the groins or axillæ. There is no increase of liver dulness.

Blood Examination.—Red corpuscles 1,150,000; hemoglobin, 25 per cent. Three weeks later red corpuscles 860,000; hemoglobin, 12 per cent. A few days before death red corpuscles 650,000; hemoglobin, 10 per cent.

The urine contained a little pus and a trace of albumin, but no casts. The patient gradually grew weaker, vomited so frequently that rectal feeding had to be resorted to, developed an acute bedsore, and was at times delirious. A short time before death there was slight transient paresis of the left face and arm. Death in coma. Clinical diagnosis, pernicious anemia.

On post-mortem examination I found the subcutaneous fat rather

[1] Read at the meeting of the Society for Clinical Research, January 29, 1895.

[2] Reported briefly by me in Transactions of the Philadelphia Pathological Society, Vol. XVI., 1893.

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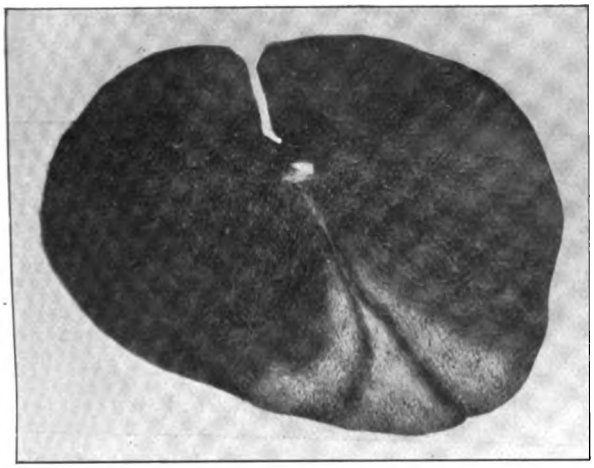

FIG. 1.—Case I (Dr. Lewis). Lower level of medulla, showing degeneration in the postero-median and postero-external columns with a band of normal tissue between.

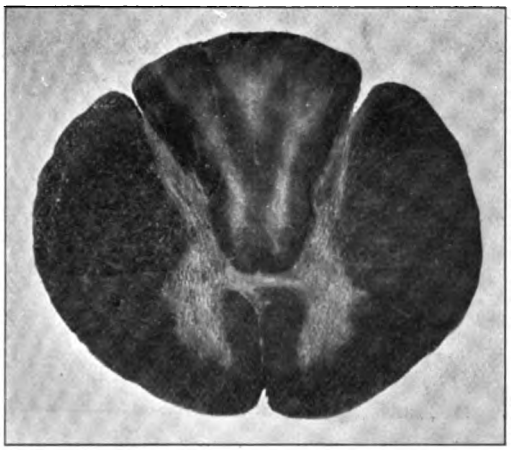

FIG. 2.—Case I (Dr. Lewis). Cervical swelling, showing the degeneration in the postero-median and postero-external columns.

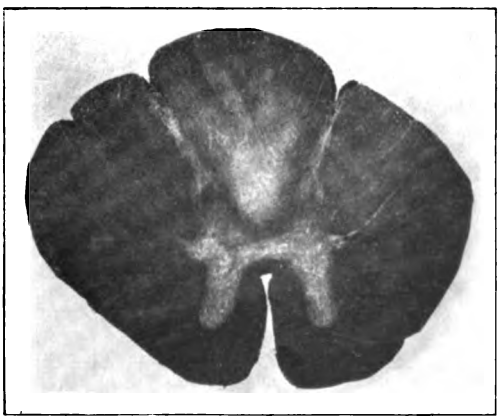

FIG. 3.—Case I (Dr. Lewis). Upper dorsal region.

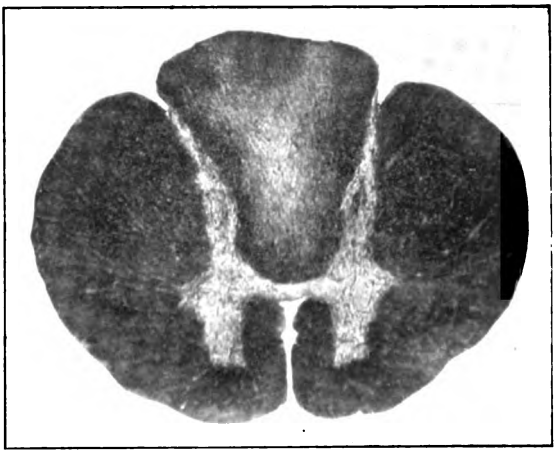

FIG. 4.—Case I (Dr. Lewis). Lower dorsal region.

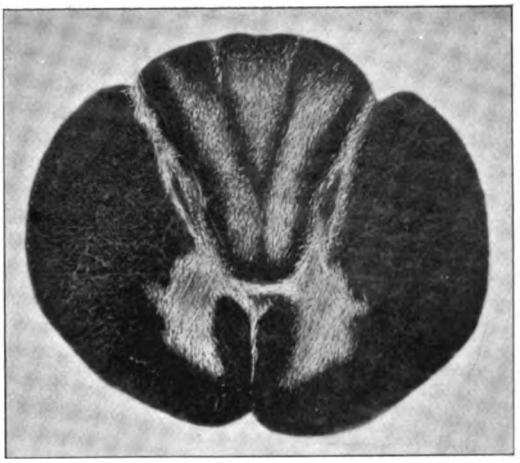

FIG. 5.—Case II (Dr. Lewis). Cervical swelling.

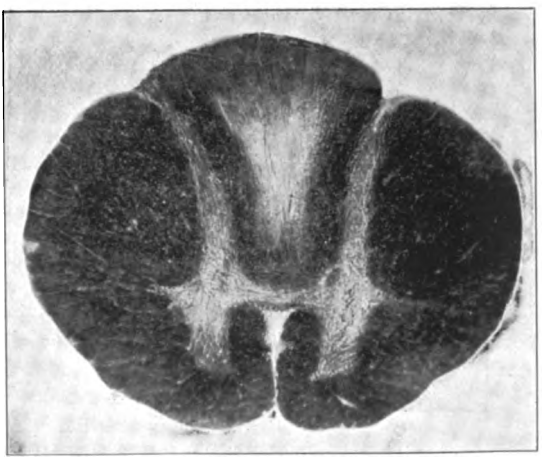

FIG. 6.—Case II (Dr. Lewis). Middle dorsal region.

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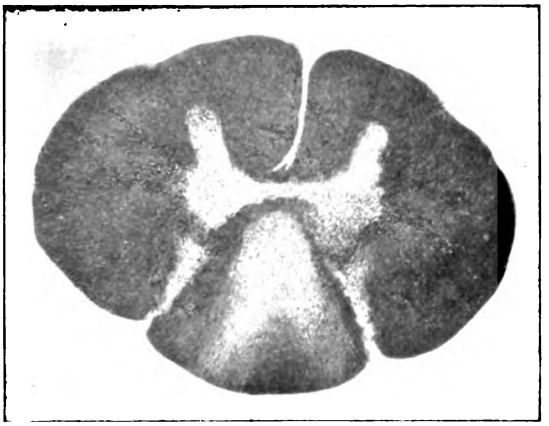

FIG. 7.—Case III (Dr. Packard). Upper dorsal region.

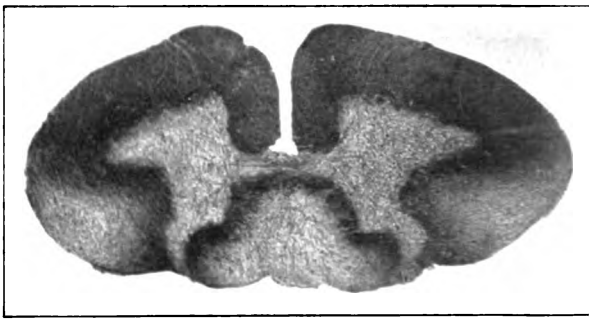

FIG. 10.—Case VI (Dr. Ireland). Cervical swelling.

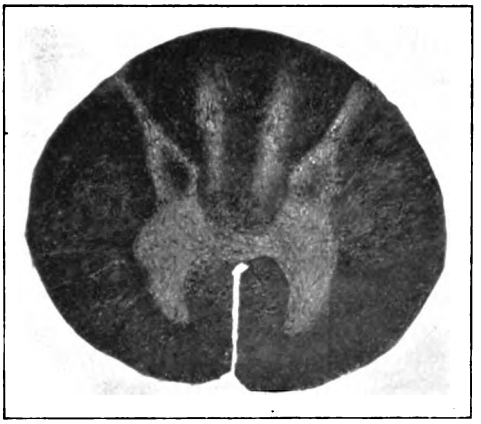

FIG. 8.—Case III (Dr. Packard). Lower dorsal region.

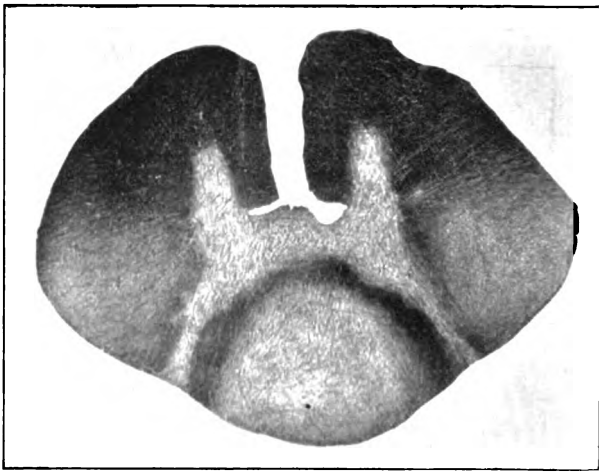

FIG. 11.—Case VI (Dr. Ireland). Upper dorsal region.

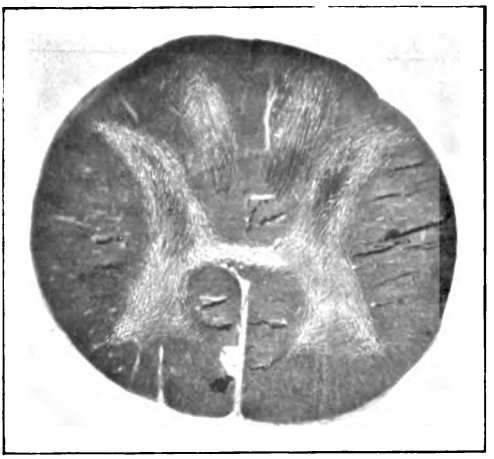

FIG. 9.—Case III (Dr. Packard). Upper lumbar region.

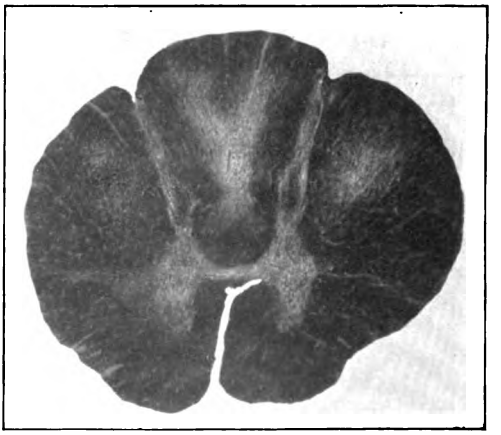

FIG. 12.—Case VII (Dr. Parke). Dorsal cord.

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abundant and orange-yellow in color. The heart was large, flabby, and contained a little liquid blood. The muscle-substance was fatty; lungs normal; liver fatty. Mucous membrane of the stomach showed no atrophy. Within the suprarenal capsules were cavities. The tibial marrow was blood-red and resembled currant-jelly. On microscopical examination quite a number of nucleated red blood-corpuscles were found. Absolutely no fat was present and the bony trabeculæ had entirely disappeared. Macroscopically the brain and cord appeared normal. The liver gave Quincke's iron reaction.

The spinal cord was hardened in Müller's fluid. On section the form of the cord was shown to be well preserved, there being no shrinking of the posterior columns. The gray matter was well marked off from the white. The only morbid condition seen was a very lightly-stained area in the posterior columns, very marked in the cervical region, and becoming less and less down the cord, until in the lumbar region it was scarcely visible.

Microscopical Examination.—Lower Level of Medulla (Fig. 1).—In the postero-median column is a wedge-shaped area of degeneration, greatest at the periphery and extending along the posterior median fissure, the apex not reaching to the posterior commissure. On the left the degeneration reaches the septum between the postero-internal and postero-external columns. On the postero-external column, on either side, is a club-shaped area of degeneration, the head towards the periphery, the handle extending inward and dorsally towards the median fissure. Between the outer and inner area of degeneration is a V-shaped area of normal tissue. The degeneration does not reach the periphery anywhere, nor does it extend to the edge of the gray matter. The lateral tracts and, indeed, the whole antero-lateral region is normal. The gray matter is normal. A few of the fibres in the posterior peripheral nerve-roots are degenerated.

Cervical Swelling (Fig. 2).—The same condition obtains, except that the posterior columns are, of course, greater in extent, and the areas of degeneration are on a larger scale, but the relative positions are the same. The posterior peripheral roots are affected to a very slight degree.

Upper Dorsal Region (Fig. 3).—There is a V-shaped band of degeneration between the postero-median and postero-external columns, involving both, the apex being about one-third the distance from the bottom of the posterior longitudinal fissure. In the middle of the postero-median column there is an area of degeneration reaching to the apex of the first. Here also the periphery and the white matter bordering on the gray are normal.

Lower Dorsal (Fig. 4).—There is a V-shaped area, base out, in

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the central part of the postero-median columns, greatest along the edge of the fissure.

Lumbar Swelling.—There is a small area of degeneration just visible to the naked eye, because it is more deeply stained by carmine between the postero-internal and external columns on one side, about half-way between the centre and periphery.

Lower Lumbar Region is Normal.—At no level is the degeneration complete, there being in every section more or fewer normal nerve-fibres, but it is distinctly visible to the naked eye. The cervical swelling is the seat of greatest insult, and from there down the lesion continuously decreases in extent and intensity. The affection of the posterior peripheral nerve-roots is confined to the cervical region and is very slight. The gray matter is nowhere diseased. There is no meningitis.

Histologically the picture varies. In certain areas there is a dense net-work of fine fibrous tissue with an increase in the number of nuclei. In others the net-work is much more open, and here and there are empty spaces as if a nerve-fibre had fallen out. Many of the present nerve-fibres are much smaller than normal, the transverse area of the sheath being much diminished. There is no increase in the number of blood-vessels, but the walls look somewhat glassy and are apparently thicker than normal.

CASE II.—(Courtesy of Dr. Morris J. Lewis.) A. B., female; aged 35 years; admitted to the Pennsylvania Hospital July 19, 1890. Complained of great weakness, diarrhea, and vomiting. Two days before admission she thought herself well enough to be about, but fell from weakness on crossing the floor. Two years before, just after her husband's death, she was first taken ill with indefinite symptoms. She was wearied and exhausted, and was in a sanitarium for some weeks. Menstruation is regular. For several months she has suffered from bleeding piles when constipated.

Examination.—No emaciation; skin yellowish and anemic; lungs, liver, and spleen normal. Heart: systolic murmur, loudest over base. No evidence of organic disease. Pupils equal, normal in size, and react well to light and with accommodation. Disks pale. No retinal hemorrhages. All the skin reflexes are slight. The knee-jerk is absent, and not reinforcible. Ankle-jerk is absent. There is no chin-jerk. Slight muscle-jerk is present on thighs. Pulse is weak and thready, 140 per minute. Temperature $103\frac{4}{5}°$ F. Tongue not coated, but reddish. There are brownish blotches on right side of face and the right thigh resembling very large freckles. There are no periosteal nodes nor glandular enlargements. Blood examination reveals hemoglobin 25 per cent.; red blood-corpuscles 2,075,000. No leucocytosis. On a second

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examination, made on the day of death, July 22, hemoglobin was reduced to 24 per cent., and the red corpuscles to 1,750,000. Clinical diagnosis, pernicious anemia.

The post-mortem was negative except that the tibial marrow was red and contained many nucleated red cells, and fat was absent. The liver responded to Quincke's iron reaction.

Microscopic Examination of the Cord.—Cervical swelling (Fig. 5).—In the postero-median column there is a wedge-shaped area of degeneration, base towards the periphery, and extending half-way to the posterior commissure. Outside this is a narrow V of normal tissue, covering which again is a narrow band of degeneration, mainly in the postero-external column. In some sections the two areas of degeneration are fused into one mass. The degeneration is least at the circumference of the cord, and in some sections there is in that situation no lesion at all. The degeneration nowhere reaches to the border of the gray matter. The gray matter and the anterior and antero-lateral tracts are normal. The peripheral nerve-roots are normal.

Upper, Middle, and Lower Dorsal Regions (Fig. 6).—There is a small, wedge-shaped area of degeneration with the base posteriorly on either side of the middle of the posterior median fissure, extending neither to the periphery nor to the commissure. There is no involvement of other parts of the transverse area of the cord.

Lumbar Region.—Perfectly normal, unless the rather less deep staining of the postero-median columns visible macroscopically, and an apparent very slight thinning out of the fibres microscopically, indicate beginning disease, which I doubt much.

CASE III.—(Courtesy of Dr. F. A. Packard.) J. F., male; white; aged 43 years; car-conductor. Previous health good. No alcoholic excess. Gonorrhea admitted. Onset of present trouble in 1887. First symptoms: anorexia, discomfort after eating, frequent vomiting, usually about an hour after eating, and marked constipation.

Examination.—First seen in 1890. Weight 119 pounds. Skin pale lemon-yellow; mucous membranes almost colorless; conjunctivæ clear; no edema; no jaundice. There is a loud venous hum in neck. Loud blowing, systolic murmur at pulmonary area, and a soft blowing murmur at apex. Very marked upward pulsation in cervical veins. No enlargement of the glands about the clavicles. Lungs normal. Liver somewhat diminished in size. Spleen of normal dimensions. Knee-jerk absent. In July the blood-count gave red corpuscles 681,250, white corpuscles 1037; hemoglobin 25 per cent. In December the body weight increased to 148 pounds. Red corpuscles rose to 2,000,000, and the hemoglobin to 50 per cent. Later profuse serous diarrhea and edema set in, and he was removed to the Presbyterian Hospital, where he died, September 10, 1891.

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Post-mortem revealed no emaciation. Marked general edema. Not very much subcutaneous fat. Heart enlarged, flabby, and with thickened walls and dilated cavities. The muscle was reddish-brown. Valves normal. The tibial marrow was red, and contained many nucleated red blood-cells. The liver gave Quincke's iron reaction. There was much clear straw-colored fluid in the abdominal and pleural cavities. The lungs were hypostatically congested, but otherwise normal. Examination of the kidneys was negative. The dorsal and lumbar cord only were sent me for examination. Macroscopically there is a distinct area of degeneration visible, after hardening in the postero-median columns.

Microscopical Examination.—Upper Dorsal Region (Fig. 7).—There is an irregular triangular area of degeneration in the posterior columns, the apex reaching almost to the commissure, and the periphery being free. The remainder of the transverse area of the cord is perfectly normal. The peripheral nerve-roots are normal.

Lower Dorsal Region (Fig. 8).—There is a thin band of degenerated tissue on either side the posterior longitudinal fissure, running parallel with it, and about half-way between it and the border of the gray matter, and reaching neither periphery nor commissure.

Upper Lumbar (Fig. 9).—The band spoken of above becomes here a spot about as big as a pin's head, situated at the middle of either posterior column.

Lower Lumbar Region.—Normal.

CASE IV.—(Courtesy of Dr. F. A. Packard.) A. S., female; white; mill-hand; aged 42 years; admitted to the Episcopal Hospital September 4, 1894. Onset three years ago after much grief. Began with loss of appetite. Later weakness, palpitation of the heart, dyspnea, puffiness under the eyes, and edema of feet.

Examination.—Hemoglobin 23 per cent.; red corpuscles 872,000; poikilocytosis; macrocytes present. *Urine:* Clear amber-color; acid; specific gravity 1007; a little pus; no albumen. *Lungs:* Resonance good except at apices. At right there are subcrepitant and on left a few crackling râles. Posteriorly resonance is impaired at angle of scapula on left side, and expiration is prolonged on both sides. There are a few crackling râles at the base. On the right side posteriorly the crackling and sibilant râles are general. *Heart:* Dulness in parasternal line at upper border of third rib, and laterally at fifth rib extends to right sternal border. Apex-beat not palpable. Wavy impulse at lower end of sternum and in epigastrium. At apex systolic murmur transmitted into axilla. At aortic cartilage systolic murmur transmitted into carotids. At pulmonary cartilage second sound sharp and rasping. *Liver:* Dulness at upper margin of sixth rib, extending slightly below costal margin. *Spleen* is enlarged downward, and tender on palpation.

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General appearance: Skin discolored a light yellow-brown. Face somewhat flabby. A little puffiness under the eyes. Conjunctivæ pale. Tongue and mucous membranes pale and dry. On a later examination, made October 10, 1894, the following condition was revealed. Skin very dark yellow, almost mahogany; conjunctivæ clear and bluish; panniculus good; tongue very white; lips and gums pale; vessels of neck pulsate very visibly; pulsation of the large veins, which is stopped by pressure below. Slight impairment of pulmonary resonance with harsh broncho-vesicular breathing and prolonged expiration. All over precordium a soft blowing systolic murmur, most marked at apex and at xiphoid. Second sound at pulmonary very valvular. Splenic dulness enlarged to costal margin. Knee-jerk is slightly diminished, but still marked. Hemoglobin 25 per cent.; red corpuscles 668,000; poikilocytosis; microcytosis. Death October 30, 1894.

Post mortem.—Body well nourished; much subcutaneous edema; muscles red; spleen plainly visible on opening abdomen. Much straw-colored fluid in peritoneal cavity. Pericardial sac moderately filled with clear fluid. Both pleural cavities contain a large quantity of clear amber-colored fluid. The heart is arrested in systole. All cavities filled with partly fluid, partly clotted blood. Right auricle stuffed with chocolate-colored post-mortem clot; foramen ovale closed. Tricuspid orifice admits four fingers and thumb. Right ventricle contains adherent, pale-red post-mortem clot. Endocardium of right side normal. Wall measures one-fourth inch. Tricuspid and pulmonary valve leaflets normal. Left auricle contains a pale red post-mortem clot. Mitral orifice admits two fingers readily. Aortic valves apparently incompetent. Left ventricular wall measures three-fourths inch in thickness. Some tabby-cat mottling seen through endocardium. In general endocardium normal in appearance. Mitral valve leaflets distinctly thickened and rigid. Aortic valve leaflets normal. Weight of heart, opened and freed from clots, thirteen and one-half ounces. Bronchial glands slightly enlarged. In left pleural cavity a few old adhesions, one particularly thick, stretching from parietal layer to an area of putty-like infiltration in upper periphery of left lung. General appearance of left lung good. Posteriorly and laterally in upper portion of upper lobe is a pea-sized mass of putty-like material distinctly encapsuled. Between middle and lower lobes of right lung numerous cobweb-like adhesions. Areas of collapse in both upper and lower lobes. At inner angle of lower lobe posteriorly an area of pneumonic consolidation one and a half inches in area. *Spleen:* Weight fifteen ounces; pulp red and firm. Gall-bladder moderately full of bile; duct patulous; duodenum normal; pylorus normal; stomach normal in size; walls slightly thin. Towards pylorus marked corrugation of mucous mem-

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brane. Intestines normal except for punctiform hemorrhages in jejunum. Suprarenal capsules normal. Kidneys rather pale, otherwise normal. *Liver:* Weight sixty-two and a half ounces, pale, flabby, and distinctly fatty. Bone-marrow red.

The dorsal and lumbar cord of the above case was kindly given me for examination. It is normal throughout.

CASE V.—*Ataxic Paraplegia, possibly due to Anemia and Secondary to Phthisis.* (Courtesy of Dr. Wharton Sinkler.) B. H., male; married; house-painter, but has not worked at his trade for years. Applied for treatment at the Infirmary for Nervous Diseases October 17, 1892. In brief his history is as follows: Family history negative. Habits good. Syphilis and gonorrhea denied. Pneumonia, as he calls it, many years ago. Never had painter's colic or wrist-drop. Has had cough (phthisis) for a long time, and has lost much flesh. The present trouble began in January, 1892, with prickling and tingling in the fingers and hands, which later extended over the entire body. Soon stiffness and weakness in walking developed. He has at times a sensation of a tight band around the waist. There is occasional slight vertigo. He passes water without difficulty, but with little feeling. Bowels are moved only by injection; appetite poor; sleeps fairly well; mental condition good.

Examination.—Extreme emaciation. The skin is of a waxy, lemon-yellow color. The mucous membranes very pale. Station is very bad, the eyes being either open or closed. Gait is ataxic and at the same time spastic. This together with his general weakness makes it impossible for him to walk more than a few yards or, indeed, even feet. The knee-jerk is much increased in amplitude, and is spastic. There is no ankle clonus. The pupils are equal, moderately dilated, and react well to light and with accommodation. All movements of the hands are markedly ataxic. Touch sense in the hands is slightly delayed; pain sense is normal. The tendon- and muscle-jerks in the arms are all increased. There is a slight chin-jerk. Slight edema of feet. No blue line on gums. *Blood:* Red corpuscles, 1,050,000; hemoglobin, 25 per cent.; no leucocytosis; poikil[illegible]nt; no nucleated red corpuscles.

The symptoms both pulmonary and nervous [illegible] worse after his one visit to the infirmary, and he die[illegible] 893, of chronic phthisis.

On post-mortem examina[illegible] Ext[illegible] l-most no subdermal fat. A[illegible] ph[illegible] h lungs. Stomach, heart, liv[illegible] sp[illegible] noteworthy. Marrow of the [illegible] in[illegible] posterior columns and crosse[illegible]

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Microscopical Examination of the Spinal Cord.—Lower Cervical Region: Complete degeneration of the posterior columns, except a very narrow band along the edge of the posterior commissure. Complete degeneration of the lateral columns back of a line drawn through the central canal. At some levels there is degeneration at the periphery of the cord almost as far forward as the anterior direct tracts. The direct pyramidal tracts are degenerated completely on both sides. The gray matter and peripheral nerve-roots are normal. There is no meningitis. *Dorsal Region:* The same condition obtains. *Lumbar Region:* Complete degeneration of the posterior columns. There is a triangular area of degeneration in the lateral column just outside and in contact with the posterior horns. The direct pyramidal tracts are degenerated even at this level. A few of the bundles of the posterior peripheral nerve-roots are markedly degenerated. The greater number are normal.

Histologically there is a very wide-meshed net-work of fibrous tissue. In many places there are apparently open spaces as if nerve-fibres had dropped out. Here and there are what look like much swollen and granular myeline sheaths with a scarcely visible or invisible axis cylinder. There are also sharply-stained points that look like naked axis cylinders. There are quite a number of scattered nuclei. There is no increase in the number of blood-vessels, and those present have walls but little if any thicker than normal. The diseased area is much more visible than in those cases in which the sclerosis is dense.

CASE VI.—(Courtesy of Dr. Weir Mitchell.) I abstract the history from one of Dr. Mitchell's clinical lessons.[1] E. S., female; single; 50 years old. Admitted to the infirmary March 2, 1894. In 1887, "nervous exhaustion." In 1889, influenza, after which she was in bed for a year on account of weakness. Never well since. In 1890, marked hysterical symptoms. In June, 1893, had a severe attack of dysentery. On August 1, red blood-corpuscles, 581,000; on September 1 the count had risen to 950,000 reds; October 18, 1,620,000. Has never menstruated since October, 1893. The skin was then lemon-yellow, conjunctivæ bluish, mucous membranes almost colorless. The apex-beat is in the fifth interspace. No thrill is felt. Area of cardiac dulness normal. There is a soft, hemic, systolic murmur, low in pitch, transmitted into the axilla, accompanying but not obliterating the first sound at the apex. There is also a higher-pitched systolic murmur (probably hemic) heard in the pulmonary area. Hemoglobin 15 per cent.; red blood-corpuscles, 930,000. There were poikilocytes, macrocytes, and microcytes in abundance, while macroscopically a drop of

[1] Medical News, July 7, 1894.

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blood looked like slightly-tinged muddy water. She improved greatly. On admission there was marked motor ataxia in the hands and legs. Numbness and tingling in hands and feet. Could not stand alone.

Plantar, epigastric, and abdominal reflexes are normal. Knee-jerk normal and reinforcible. Elbow-jerks normal. Muscle-jerks throughout the body normal. Touch and temperature sense normal. Areas of analgesia varying in situation from day to day are present. Muscular response to faradism normal. de Schweinitz and Thomson report both disks gray. Arteries too small; veins normal. Pupils normal. Color-fields (red and blue) *typically reversed.* Form-fields contracted. The blood count rose to 3,200,000 red corpuscles with 60 per cent. hemoglobin. Many of the hysterical manifestations I have omitted. For a time she did very well and improved greatly, so that she was able to walk, to feed herself, and even to sew, but later she relapsed and became bedridden. The corpuscular count fell to 1,600,000; hemoglobin 20 per cent.; and she died September 1, 1894.

At post-mortem I found quite marked emaciation. Skin lemon-yellow. Subcutaneous fat small in amount, orange-yellow in color. Muscles very dark red. Blood liquid throughout the body. *Heart* normal in size. Cavities contain a little semi-fluid blood; walls average thickness; muscle brownish; very slight old thickening of mitral valves. Liver slightly fatty. Lungs, kidneys, and spleen showed nothing noteworthy. No gastric atrophy. Tibial marrow currant-jelly color, broken-down cancellated bone tissue. No fat. Many nucleated red corpuscles. Cerebral membranes and brain normal; spinal membranes normal. On cross-section of the spinal cord the posterior columns are pearly gray.

Microscopical Examination, Highest Level of Cervical Cord.—Very marked degeneration of the posterior columns except a narrow level along the edge of the gray matter. In the lateral columns in the region of the crossed pyramidal tracts, but not confined strictly to them and not in contact with the posterior gray matter, is an area of much slighter but still quite marked degeneration. Running round the periphery of the lateral columns and reaching quite far forward is an irregular band of not very marked degeneration. The intensity of the lesion varies much. It is patchy, worse here, better there. The remainder of the white matter and the gray matter normal. Peripheral nerve-roots normal. No meningitis.

Cervical Swelling (Fig. 10).—The same condition obtains.

Upper Dorsal Region (Fig. 11).—The condition is the same except that the band of healthy tissue between the gray matter and the posterior columns is wider, and there are quite a number of healthy fibres

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in the periphery of the latter. Marked degeneration of the crossed pyramidal tracts. Cerebellar tract fairly normal.

Lower Dorsal Region.—The same.

Lumbar Swelling.—Slight degeneration of the postero-internal column; very slight of postero-external. A small area of degeneration in the crossed pyramidal tract.

Histological Examination.—There is a very fine and very dense net-work of connective tissue. No increase of blood-vessels and slight thickening of their walls. There is no histological difference between the lesion in the posterior and that in the lateral columns. Median and sciatic nerves normal.

CASE VII.—(Courtesy of Dr. William E. Parke.) Mrs. E., 60 years old; has had much grief in recent years. Began to feel weak in latter part of 1890. Lost appetite. Some diarrhea. No vomiting till just before death. Dyspnea; palpitation; no emaciation; no cutaneous hemorrhages. Towards the end edema beginning in the legs and ascending. Skin lemon-yellow. The blood was examined by Dr. J. P. C. Griffith, who reported hemoglobin 20 per cent.; red corpuscles 528,000. Macrocytes and microcytes were present. At the autopsy the tibial marrow was found to be red and contained nucleated red corpuscles. The liver gave Quincke's iron reaction.

The dorsal (Fig. 12) cord was sent me for examination. It revealed an irregularly V-shaped area of degeneration in the middle of the postero-internal columns along the border of the posterior longitudinal fissure and a small area on one side in the crossed pyramidal tract. The remainder of the white and the gray matter normal. Peripheral nerve-roots normal.

CASE VIII.—(Courtesy of Dr. John Musser.) Anemia secondary to dysentery. A. C, female; white; married. Admitted to the Presbyterian Hospital September 13, 1892. Previous history negative. In July, 1892, chill followed by bloody stools. Was delirious for three weeks, has grown weaker ever since. Bowels are very loose and movements are involuntary. She complains much of abdominal pain. Since in hospital no blood or mucus in stools. Much nausea and vomiting. Red blood-corpuscles 2,000,000.

Post-mortem.—No emaciation; general edema; subcutaneous fat one inch thick; viscera pallid; muscles pale; tibial marrow pale yellow. Heart enlarged; much surrounding fat. Muscle pale yellow-brown in color. Slight atheroma of the aorta; valves normal. Liver large, pale-yellow. Spleen not enlarged, soft, brownish-red on section. Kidneys negative. Lower part of small intestine and large intestine chronically inflamed. Numerous dysenteric ulcers.

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The dorsal and lumbar cord were sent to me, and on examination proved normal.

CASE IX.—(Courtesy of Dr. F. P. Henry.) J. M., male; 64 years old; laborer. Admitted to the Philadelphia Hospital, April 26, 1894. He has been slowly growing weaker for several years. Complains of slight dyspnea upon exertion. During his entire stay in the hospital he complained only of weakness.

Examination.—Soft systolic murmur at apex. A more distinct systolic murmur at aortic cartilage transmitted into the vessels of the neck. Slight edema of the feet which disappeared when he was put to bed.

The skin was desperately pale. At the first examination of the blood, made by Dr. Henry, there were 1,275,000 red blood-corpuscles. At a later examination, made by Dr. Daland, the hematokrit being used, there were 25 per cent. of the normal number of red blood-corpuscles. Fleischl's hemoglobinometer gave 20 per cent. of hemoglobin.

Dr. de Schweinitz examined the eyes and found numerous old and recent retinal hemorrhages.

The knee-jerks are abolished. Urine contains neither sugar nor albumin. Liver, lungs, spleen, and kidneys give neither signs nor symptoms of disease. There is a freckle-like pigmentation over the entire body except the palms and soles. The patient died May 13, 1894.

Post-mortem examination was largely negative. There was only a small amount of intensely yellow subcutaneous fat. The tibial marrow was slightly tinged with red.

The spinal cord was given me for examination. At the lowest level of the crossing of the pyramids there is degeneration of the posterior columns, but not extending to the border of the gray matter. In the lateral columns there is a small area of degeneration at the periphery just outside of the posterior horns.

In the cervical swelling there is a patchy degeneration affecting the whole transverse area of the posterior columns and much more pronounced in some fields than in others. In the lateral tracts there is a wedge-shaped area (base out) of degeneration just external to the posterior horns.

The same condition obtains in the dorsal region. The lumbar cord was not examined. The gray matter and the posterior peripheral nerve-roots were not affected.

Histologically, nothing was seen but a very dense net-work of very fine connective tissue, a large number of corpora amylacea, and an apparent slight increase in the number of blood-vessels in the affected white matter.

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The first study of the spinal cord in pernicious anemia was given in a paper by Lichtheim.[1] In his two cases there was degeneration in the posterior columns with slight changes in the lateral and anterior columns. He holds that some toxic substance may affect both blood and cord. The process differs from that of true tabes in the absence of shrinking of the posterior columns, the numerous granular cells present, and the involvement of other parts of the white matter. In a later paper[2] he remarks that the localization is unlike that in tabes, being greatest in the cervical cord. Clarke's columns, Lissaur's zone, and the peripheral nerves are intact. In referring to the toxic origin of the degeneration he speaks of syphilitic tabes, disease of the cord occurring in diabetes mellitus, and of four cases of long-standing icterus observed by Minick, three of which showed changes in the posterior columns.

The history of Von Noorden's[3] case is in brief as follows: Female, 59 years old. A progressive and apparently causeless anemia began to develop about ten months before death. There was weakness in the legs. The knee-jerk was absent. There was diminished sensation in the legs. The white blood-corpuscles were relatively increased but absolutely decreased. There were lymphocytes of small size. There were no nucleated red corpuscles. Poikilocytosis was present. The red corpuscles numbered 700,000.

On microscopic examination, section through the lower third of the olive was normal, as was the rest of the medulla, except a small area in the left lateral border posteriorly to the roots of the vagus. The long fibres in that situation had in great part disappeared, those remaining being much thickened. In the upper part of the decussation of the pyramids there was distinct degeneration of the cerebellar lateral tracts. In the lower part of the decussation there was degeneration of the lateral pyramidal and lateral cerebellar tracts, and of the posterior columns except where they border on the posterior horns. In the cervical region there was degeneration in the direct and crossed pyramidal tracts, the cerebellar tracts, and the posterior columns. The nerve-roots were very slightly affected. As the sections were made lower and lower down the diseased areas became less and less in extent. Histologically there was a disappearance of the nerve-fibres, leaving a connective-tissue net-work. The blood-vessels were filled. There were no accumulations of nuclei nor hemorrhages. There were no changes in the crural nerves, but in the tibials and peroneals there was a moderately high grade of degeneration.

[1] Congress für innere Medicin, 1887.
[2] Centralblatt für allgemeine Pathologie und pathologische Anatomie, 1890–91, p. 20.
[3] Charité Annalen, 1891, XVI, p. 260; a second paper, Charité Annalen, 1892, XVII, p. 202.

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Minick[1] reported six cases, of which two had been previously reported by Lichtheim and one was given to Minick by Valentine.

CASE I.—Duration four months. General weakness and anemia. Paresthesia of arms and feet. Slow, insecure gait and swaying. No paresis; no objective sensory symptoms. The knee-jerk was normal.

In the spinal cord there was symmetrical degeneration of the columns of Goll in the cervical and upper dorsal region. There was a diffuse degeneration in the columns of Burdach in the lumbar cord principally around the septum of the middle root zones. The posterior peripheral roots were without change. The degeneration was of two forms. In the one there were small foci in the middle root zones in the entire length of the cord except the so-called sacral portion. The second was a compact degeneration occupying the greater part of the columns of Goll in the upper dorsal and cervical regions.

CASE II.—About two years' duration. General motor weakness. The knee-jerk absent. Numbness of the feet and hands without objective sensory disturbance, with later a general diminution of sensation. No ataxia. Post mortem there was found symmetrical degeneration of the greater part of the columns of Goll, with the exception of the base, from the cervical to the middle dorsal cord. There were foci of degeneration in the central part of the columns of Burdach throughout the entire length of the cord. The posterior roots were intact.

CASE III.—Symptoms of pernicious anemia for ten weeks before death. Legs felt weak and paresthesiæ were present. Ataxia of all extremities. Knee-jerk lost. Anesthesia in legs. Reflex inactivity of pupils. Death from pneumonia.

There were irregular foci of degeneration in the posterior columns from the cervical to the lumbar region of the cord, less and less in extent as it descended. There was slight beginning irregular dengeneration in the postero-lateral white matter. The posterior roots and peripheral nerves were intact.

CASE IV.—While this case did not present all the symptoms of pernicious anemia, lacking the typical blood condition, and not presenting the fatty heart muscle, post mortem, yet Minick classes it among the essential anemiæ. Male, 36 years old. During the progress of a severe general sickness there appeared paresthesiæ in the arms and legs, with motor weakness and difficulty in walking. Later ataxia, spastic gait, increased tendon-jerks, slight paresis of bladder and rectum. No fixation of the pupils. Retinal hemorrhages. No poikilocytosis. Systolic murmur. Death from broncho-pneumonia.

Post-mortem.—There were found in the cord extensive foci of fresh degeneration around the septum of the posterior columns, decreasing

[1] Zeitschrift für klinische Medicin, 1892, VI, p. 25.

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as one passed down the cord. Similar degeneration of like intensity in the posterior part of the lateral columns extending to the lower dorsal region. Scattered myelitic foci in the anterior white matter in the cervical and upper dorsal cord. The posterior roots and peripheral nerves intact.

CASE V.—Male, 58 years old. General fatigue. Weakness in legs and arms with slight pains. Ataxia in legs. Disturbance of muscle sense. Partial loss of sensation in all extremities. Leg- and arm-jerks present. Some weakness of bladder. Later there was almost total loss of pain sense in the legs. In the arms diminution of touch, temperature, and muscle sense. Knee-jerks weak. No immobility of the pupils.

There was total degeneration of the posterior cord, with the exception of a small zone by the gray substance, in the cervical and dorsal region. Irregular degeneration principally in the middle root zones in lumbar region. Extensive disease of the postero-lateral white matter extending as low down as the lumbar region. Similar changes along the septum in the anterior white matter in the middle cervical and upper dorsal region. Posterior roots intact.

CASE VI.—Male, 42 years. Leg-pains. Inability to walk or stand, though, when supported, all movements could be properly performed. Obstinate constipation. Sensation in all qualities diminished. Knee-jerk increased. Incontinence of urine and feces.

There was degeneration of the columns of Goll in the cervical and upper dorsal cord. Foci of degeneration in Burdach's column extending to the sacral region. Extensive marginal degeneration at the base of the posterior columns and in the lateral tracts to the lumbar cord. Irregular foci of sclerosis along the anterior median septum. Roots free.

From a study of these and other cases Minick concludes that the cordal lesions cannot be the direct result of the changes in the blood condition, but the two are the result of the same cause, which is undoubtedly a poison.

Eisenlohr[1] reports the following case. There first appeared weakness in the arms and legs accompanied by formication and vertigo. Marked anemia, some but not great poikilocytosis. Atrophy of the small hand muscles. Gait spastic, ataxic. Knee-jerk absent. Sensation not much disturbed. Incontinence of urine and feces. Delirium.

There was atrophy of the mucous membrane of the stomach and intestine. Throughout the whole length of the cord there was degeneration in the posterior and lateral columns. The condition resembled

[1] Deutsche medicinische Wochenschrift, 1892, p. 1105.

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somewhat that of true tabes, attacking the columns of Goll and Burdach, and especially the posterior root zones. The degeneration was least marked in the lumbar cord, most intense in the upper regions. There was degeneration in a branch of the right saphenous nerve. The author concludes that the primary condition was atrophy of the mucous membrane which caused the anemia, and this, in consequence of the associated tissue-change disturbance, caused the cordal disease.

Nonne[1] reports two cases.

CASE I.—Male, 48 years old. About three months after the onset moderate pains in the legs, gradual weakness, knee-jerk absent; ataxia; no sensory trouble; pupillary reactions slow; transient paralysis of bladder; paroxysms of clonic contractions in arms. Later knee-jerk returned. No spastic symptoms. Oligopoikilocytosis. Retinal hemorrhages. Death from phthisis.

In the cord there were scattered foci of degeneration in the posterior region throughout its whole extent. The middle root zones were especially affected. From the upper dorsal upward secondary degeneration in the columns of Goll. In the lateral tracts small and irregular foci of degeneration. In the upper cervical region there was marginal and central degeneration in the lateral tracts.

On histological examination foci, in different stages of degeneration, were found in the cervical cord. The fibre-sheaths were sometimes swollen. Under a high power there is a honeycombed appearance. A clear homogeneous mass fills up the spaces. In other spaces only the axis cylinders are seen. Many spaces are empty. The capillary walls are thickened and hyaline. The lymph-sheaths of the capillaries were filled up with flakes and detritus in places and one was obliterated. In the lateral and anterior pyramidal tracts only fresh foci were found scattered amidst the healthy tissue. In the posterior columns the lesion was greatest in the cervical and dorsal cord, least in the lumbar region.

CASE II.—Without apparent reason paresis and moderate pains developed in legs with ataxia. Later girdle sensation, gastric disturbance, paresthesia in arms, knee-jerk diminished. Diminished touch- and pain-sense in legs; normal pupillary reaction. After two months the ataxia disappeared; knee-jerk normal; sensory trouble doubtful. There then developed a bad progressive anemia that was fatal in ten months. No return of cordal symptoms.

There were found post mortem slight adhesions between pia and dura in brain and cord. There was scattered degeneration in the entire length of the posterior columns. Numerous small isolated foci in the lateral column. Posterior roots free. The sheaths and axis cylinders

[1] Archiv für Psychiatrie und Neuenheilkunde, 1893, XXV, 421.

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were swollen or shrunken. There was much space formation. There was a secondary neurogliar growth and increase of the nuclei. No change in the peripheral nerves.

Bowman[1] reports the following case: Female, aged 53 years. Ailing about three years. Weakness but no paralysis. Gait not observed because of weakness. No ataxia. Some diminution of sensation. Knee-jerk brisk; wrist-jerk readily obtained; no clonus; pupils normal; retinal hemorrhages. Red corpuscles 19.5 per cent.; hemoglobin 20 per cent. Later ataxia in hands, sensation became normal, and then relapsed again under treatment. Legs became semiflexed and rigid, passive extension causing pain. Clonus developed and ataxia became marked.

There was found in the sacral cord a small patch of degeneration at the outer and posterior margin of the lateral columns. In the upper lumbar there was a patch of degeneration, in the lateral columns and in the posterior column marked degeneration of Goll's tract. In the dorsal region extensive degeneration in both the lateral and posterior columns. In the cervical region less degeneration in the lateral tracts. Almost complete in the columns of Goll. The anterior columns affected in the anterior and median margins. At the lower level of the decussation there was a wedge-shaped area in the posterior columns, chiefly along the median septum, with a small peripheral area of degeneration in the lateral columns.

In the most recent areas a few isolated fibres are found with swollen sheaths, the axis cylinders being normal. Some empty spaces are found where the fibres have dropped out, probably in the cutting and staining. There was no change in the interstitial substance. In the more advanced parts the proportion of healthy fibres is much smaller, and, in addition to the above change, the interstitial tissue was thickened and a number of nuclei were found. In the most advanced parts there was a large excess of interstitial substance. The vessels have proliferated nuclei in the sheaths of the smaller arterioles in the early stages, while in the later stage the sheaths are crammed with cells, the lumen remaining normal. In the most advanced parts the lumen is diminished. The posterior roots and horns were free.

The author concludes, the process, it may be inferred, is a primary one, though the denser degeneration found in the crossed pyramidal tracts at the lower levels and in the columns of Goll above the mid-dorsal region are probably of the nature of secondary descending and ascending degenerations. The change resembles that found in the combined sclerosis unassociated with anemia, especially the ataxic paraplegia of Gomes.

[1] Brain, Summer Number, 1894. p. 198.

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"It is unwise to be too positive as to the relation of the nervous symptoms to the altered blood state, though I am inclined to regard the anemia as primary and probably the cause of change in the cord."

Quite recently Lichtenstein[1] has reported a case of tabes dorsalis, during the course of which the complete symptom complex of an essential anemia developed and was the cause of death. Post-mortem proved the correctness of the clinical diagnosis. Lichtenstein believed the anemia to be due to the tabes.

Lloyd presented to the Philadelphia Pathological Society, a few meetings ago, a report of a case of pernicious anemia, not yet published, in which there were marked changes in the posterior columns.

Conclusions.

The evidence given above certainly proves that the coexistence of pernicious anemia and certain lesions of the cord is not accidental. The cord was normal in only one (Case IV) of my seven cases, and these cases were successive, were not examined post mortem because it was hoped they would show cord changes, but with the intention of getting as large a mass of material for study as possible. I have been unable to find in the literature any case in which an anemia, anything like so intense as that of Case IV, has been unaccompanied by distinct and positive cord lesions.

The localization of the cord lesion in pernicious anemia is fairly characteristic and constant. The cervical swelling is always the seat of greatest insult, and the lesion progressively decreases in intensity and extent at lower and lower levels of the cord till, in the lumbar region, there is either no disease at all or it is extremely slight. There are some exceptions to this rule of the non-involvement of the lumbar cord. Thus in Bowman's case it was the seat of marked postero-lateral degeneration.

The only parts of the cord ever affected are the posterior columns, the lateral columns in and near the crossed pyramidal tracts, the direct pyramidal tracts, and rarely a band running forward along the circumference of the cord (the direct cerebellar tracts). The gray matter is never affected seriously and rarely even slightly. The degeneration of the posterior peripheral roots, when present, is ordinarily so slight as to be of no importance. In the greater number of cases there is marked posterior degeneration with some, but much less marked, degeneration of the lateral columns in and around the crossed pyramidal tracts. The posterior columns may be affected alone, the lateral never alone. Almost invariably there is a band of normal white tissue separating the diseased area in the posterior columns from the gray matter. Not

[1] Deutsche medicinische Wochenschrift, 1894, p. 849.

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very rarely there are two distinct areas of degeneration in the posterior columns in the cervical region, one in the postero-internal, the other in the postero-external column, the two being separated by a band of normal or almost normal white matter. In the lower dorsal and lumbar cord the most frequent seat is midway between the posterior median longitudinal fissure or septum and the posterior gray matter. Almost always there is normal white matter between the posterior horn and the diseased area in the lateral columns. The lesion is always symmetrical in the two halves of the cord, often absolutely so, but sometimes descending farther on one side than on the other. The degeneration never produces gross deformity, alterations in the shape of the cord. There is never, for instance, shrinking in the posterior columns.

Histologically my results have not been very fruitful. I think, however, that the lesion will probably be proven to be primary in the nerve-fibres themselves, and not in the blood-vessels. At all events, in the cases I have examined there has not been any evidence of marked vascular disease. I also have not been able to make any histological distinction between the process taking place in the posterior and that in the lateral columns. The condition is not systemic,—that is, it is not strictly confined to any one tract or set of tracts, but overlaps boundaries. In the lateral tracts it is more strictly limited than in the posterior columns, but even there it overflows.

The cause of the cordal lesions is not as yet definitely determined. The simplest explanation, that the lesions are due directly to the anemia,—are, if one may so express it, the evidences of a local starvation,—is simple rather than satisfactory. In other anemias comparable changes are not found. We would not expect to find such limited changes in a starvation process. Rather, the whole transverse area of the cord would be affected. The supposition that normally the posterior columns have a poorer blood-supply than the remainder of the cord has not been proven. Another theory, and one that has much evidence to support it, is that both the anemia and the cordal lesions are due to a common cause,—a poison or poisons. As to the anemia, there is much to be said in favor of the view that it is the result of an intoxication from a poison or poisons originating either within or without the body, and that poisons can act upon the spinal cord is, of course, well known. The result of such intoxication is seen, for instance, in the posterior degeneration occurring after diphtheria, studied only recently by Bickels.[1] In pellagra there are always distinct changes in the lateral and quite frequently in the posterior columns, most marked in the cervical region. In the allied disease—ergotism—

[1] Obersteiner's Arbeiten, Part II.

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there are also definite and constant cord lesions. According to Tuczek there[1] is disease of the posterior columns, especially Burdach's tract, including Westphal's root zone, extending throughout the whole length of the cord to the posterior pyramidal nucleus in the medulla. Histologically there is an atrophy of the nerve-fibres with proliferation of the neuroglia, but without any affection of the vessels, together with the occurrence of granular cells and amylaceous corpuscles.

Our knowledge of the spinal cord in other diseases in which anemia is a prominent symptom is very limited. I have examined cords from chronic Bright's disease, phthisis, and cancer of the stomach, but so far have never found anything more than a slight diffuse increase in the connective tissue. Paraplegia, usually motor only, but sometimes accompanied by hyperesthesia, occurs in quantitative anemia due to hemorrhage, usually from the stomach, kidneys, or uterus. It may come on within a few hours of the hemorrhage or not until one or two weeks later. According to Gowers most cases recover. We know nothing of the condition of the cord. Gowers speaks also of the occurrence of paraplegia in chlorosis, but so far as I know no autopsies have been made. Spinal symptoms of any kind are not common in chlorosis, and I cannot find any authoritative statement even as to the condition of the knee-jerk. Opinions vary much. I have never seen it abolished nor spastic. That extreme secondary anemia may coexist with a normal cord is proven by Case VIII. It is quite curious, and possibly may prove to have some meaning, that a patient of Tizzoni, whose suprarenals were removed, developed changes in the cord, and that a case of Addison's disease quoted by Lichtheim showed post mortem marked changes in the posterior columns.

The spinal symptoms of pernicious anemia are usually so overshadowed by those of the blood condition that they are apt to be neglected, and not rarely in cases carefully examined the lesions found post mortem are much greater than the symptoms would indicate. Though the ataxia may be extreme there is never a perfect picture of tabes dorsalis. The condition present could not cause it. The knee-jerk is very often abolished, but it may be much increased. Ankle-clonus is rarely present. The presence of a true paraplegia is often difficult to determine on account of the great general weakness. Any local palsy is, of course, due to some complication, as, for example, cerebral hemorrhage. Though paresthesias are very frequent, and delayed or diminished sensation not infrequent, absolute anesthesia almost never occurs. There are never the lancinating pains characteristic of tabes, nor the girdle feeling. There may be slowness

[1] Pellagra, Ergotism, Tuke's Dictionary of Psychological Medicine.

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in the pupillary reactions, but Argyll-Robertson's pupil never occurs.

The diagnosis of the two diseases is therefore ordinarily easy, but there is one condition in which a knowledge of the occurrence of spinal symptoms in pernicious anemia is of great importance. Not very rarely patients present themselves complaining of dyspeptic troubles, weakness, numbness, and tingling in the extremities and slight trouble in walking and in using the hands; and on examination we find more or less ataxia, absent knee-jerk, and possibly diminished sensation, but not the other signs of tabes. Blood examination will often show marked anemia and give us the clue to the real trouble. I, of course, do not mean that this is a common thing, but it does occur. One must remember, however, that not very unfrequently a secondary anemia develops late in tabes. Again it seems to me possible that some of the cases presenting tabetic symptoms beginning in the arms, which are apt to run a very aberrant course, may be due to pernicious anemia. In the only two cases I have ever seen there was a history of a profound anemia coming on before the ataxic symptoms appeared, but untoward circumstances prevented a blood examination.

In a few cases (Bowman's, and Case V of my series, for example) there have been in life the symptoms of ataxic paraplegia, and in death the proper lesions. I am strongly inclined to believe that my case does not properly belong here at all, but that the anemia developed after the cordal trouble and was merely a coincidental complication. At the autopsy there was marked emaciation, the liver did not respond to Quincke's iron test, and the marrow was normal. All this is against pernicious anemia. Whatever the truth may be, it is certain that symptoms referable to the posterior columns are much more frequent than those due to disease in the lateral tracts.

I must thank Dr. Florence H. Watson, the resident pathologist at the State Hospital for the Insane, at Norristown, and Dr. J. H. Rhein, for much valuable assistance. I owe the photographs to the skill of Mr. Middleton.

1327 Spruce Street, Phila.

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EVISCERATION OF THE EYEBALL, WITH INSERTION OF ARTIFICIAL VITREOUS.[1]

By G. Oram Ring, A.M., M.D.,

Ophthalmic Surgeon to the Episcopal Hospital, Philadelphia; Ophthalmic and Aural Surgeon to the Samaritan Hospital, Philadelphia.

No matter to what extent the ophthalmic surgeon endeavors to minimize the formidable character of the operation of enucleation, it will probably ever continue to be regarded by the laity as one of the most to be dreaded of the so-called major operations.

We are indebted to Fröhlich for bringing to our notice an operation in the nature of a substitute. In 1881, while attempting to remove a foreign body from the interior of the eye, he, in a purely accidental way, emptied the globe of its contents; the ball shortly becoming quiet. He applied the term excochleation, or "scooping out," to the procedure.

It is a curious coincident that the thought-seed sown at that time should have germinated three years later in three different brains. Mr. Mules, of Manchester, tells us in his address before the Ophthalmological Society of the United Kingdom, March 12, 1885, that he, for the prevention of sympathetic ophthalmitis, Professor Graefe, of Halle, for the prevention of purulent meningitis, a very rare complication, and Mülder, in his experiments upon rabbits and upon the cadaver, performed the operation of evisceration or excochleation, each without the knowledge of the other's views. During the same year, at the suggestion of the latter, Dubanton performed a similar series of experiments, arriving at conclusions similar to Graefe's, namely:—

That the procedure equalled in value enucleation in sympathetic disease, was safer as regards danger of purulent meningitis, can be performed in panophthalmitis, and that whenever done a better stump is always secured. Graefe eviscerated eyeballs with success in advanced cases of iridocyclitis and conditions which follow it, in staphyloma, in glaucoma, in cysticercus, in old hemophthalmus, and in many beginning and established cases of panophthalmitis.

Meyer says of the ordinary operation of evisceration that he frequently has seen severe and lasting reaction, but always with subsequently good results. He prefers the classical enucleation which under strict antisepsis he thinks is not attended with more danger than evisceration. He gives Noyes the credit of having first suggested the operation, and advises the use of iced sublimate solution for controlling hemorrhage.

[1] Read, by invitation, before the Ophthalmic Section of the College of Physicians of Philadelphia, January, 1895.

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EVISCERATION OF THE EYEBALL.

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de Schweinitz notes that the operation is followed by considerable pain, edema, and swelling of surrounding tissues, to avoid which a horse-hair drain is suggested. Noyes mentions that reaction will always be greater than after enucleation, and that some orbital cellulitis is always present, but thinks it most desirable to avoid the removal of the globe, if possible, especially in cases of staphyloma where a yawning chasm is left which an artificial eye cannot suitably fill.

Fuchs questions whether evisceration of the suppurating eye is a less dangerous procedure than enucleation, since cases of death after this operation have been noted in a paper by Schulek.

It must, however, be observed that some cases have been known in which fatal meningitis has succeeded a panophthalmitis without any operative interference.

It is especially in a suppurative panophthalmitis that Henry D. Noyes[1] objects to the substitution of evisceration for enucleation, upon the ground that, in the event of orbital inflammation of sufficient severity to compel deep incisions of the tissues, the presence of the eviscerated ball would have distinctly hindered the escape of fluid, and, under such circumstances, the effusion growing greater he had more than once been obliged to cut through the back of the open globe to give vent to the fluids behind. He does not regard the enucleation as contributing to the risks of meningeal disease, much less, responsible for the cerebral symptoms.

In a total of 4000 enucleations, including the Vienna Clinic, Moorfield's, the clinic of Dr. Knapp, and that of the New York Eye and Ear Infirmary, but one death occurred, and if it is possible for purulent panophthalmitis and death to follow the extraction of cataract, antiseptically performed, as reported by Webster, nothing more having been done to the globe, Dr. Knapp concludes that enucleation is justifiable and preferable, notwithstanding the notes of alarm that have reached us from Von Graefe and Bunge.

Dr. F. C. Hotz, of Chicago, in an exceedingly interesting paper upon "A Case of Sympathetic Neuritis after Evisceration of the Eyeball," presented before the Ophthalmic Section of the 44th annual meeting of the American Medical Association, reported in the Transactions of 1893, reviews a portion of the literature of evisceration. Schuleck, of Buda-Pesth, lost two cases among thirty-six eviscerations (Otto Becker, "Enucleation and Exenteration"), and the cases reported by Dr. Cross[2] are also quoted. The above cases were thought to be due to the presence of the glass ball, but in the case of Dr. Hotz no artificial vitreous was inserted, the operation being an ordinary evis-

[1] Transactions of the American Ophthalmological Society, Vol. v.
[2] British Medical Journal, July, 1887.

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ceration. The eyeball had been pierced by a penknife at the corneo-scleral junction into the vitreous, and was lost as the result of an irido-cyclitis followed by atrophy. Two weeks after the operation an optic neuritis of the good eye developed, which did not subside until all signs of inflammation in the eviscerated eye disappeared. Dr. Hotz notes that violent reaction is not unusual, even after perfectly smooth operations, and that we, therefore, have conditions which may possibly lead to sympathetic inflammation. He opposes the procedure, in addition, because of the severity of the pain and the slowness of recovery following it, and because he questions the superiority of the cosmetic effect over that of enucleation.

Dr. Bunge's cases of evisceration averaged nine days, and Dr. Hecht's, in Schweigger's clinic, ten and two-fifths days. Dr. Hotz is in the habit of discharging his cases after enucleation in three or four days. The perimetric measurements of outward and inward rotation by reflection of the candle-flame upon the glass cornea have, so far as I am aware, not been repeated, but will be in a series of cases now being performed in this city. Equally good rotation is claimed by Dr. Hotz after enucleation as after evisceration, the latter, however, being without the insertion of an artificial vitreous.

Mr. Mules is a warm advocate of evisceration. He regards it as less formidable, as not disturbing the normal relation of the parts outside of the sclera, as not evidencing any tendency to the formation of cicatricial bands, and as certain to produce a stump with fair movement. His modification of the operation—the introduction of an artificial glass ball into the cavity of the sclera—was purely for cosmetic reasons. This he suggested ten years ago.

The details of the operation I shall discuss later. Of his first nine cases, six suppurated more or less, and in each of four,—thinking the irritation due to the presence of the ball, the latter was removed. This, he is convinced by his later successes, was unnecessary, and with improved technique and thorough antisepsis regards the reaction as trivial and the success as guaranteed. An experience of over 100 cases, with almost uniformly fine results, has tended to render him exceedingly enthusiastic. That his enthusiasm is not more generally shared by ophthalmic surgeons seems to be due to want of care in carrying out the details of the operation, or because of an unwillingness to risk its performance.

Mr. Mules believed it adapted to all cases except those of malignant disease.

It has been modified by Mr. Keall, of Bristol, in the introduction of a hollow, silver ball, and in its details by Mr. Brudenell Carter, of London, and by T. H. Bickerton, of Liverpool.

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Mr. W. P. Keall, of Bristol, reports two cases of evisceration with introduction of a silver artificial vitreous, before the Ophthalmic Society of the United Kingdom, both of which were entirely successful; the one, a case of opaque anterior staphyloma, the second, an opaque cornea from gonorrheal ophthalmia. The details of the operation were similar to those advised by Mr. Mules, except that the sclerotic was stitched horizontally and the conjunctiva perpendicularly.

In both of these cases a smart blow upon the eye with a stick a short time after the operation resulted only in producing a black eye. Mr. Keall is of the opinion that had a glass ball been introduced it would have been broken, rendering enucleation necessary. Mr. Keall has particularly noted that the disagreeable muco-purulent discharge, so common after enucleation, was absent after evisceration.

Prince,[1] of Jacksonville, Ill., expressed the opinion that the pain resulting from the operation was due to the effect of tension, pressure, and inflammation; that there was probably irritation of the long ciliary nerves left exposed by the operation, as they run forward in grooves in the concave surface of the sclera, he therefore cauterized the whole interior of the sclera at the completion of the operation with pure carbolic acid, regarding the process as at once anesthetic and antiseptic. While his immediate results were good, later on in five out of six cases absorption of the tissues along the line of union was followed by the expulsion of the glass ball, and the contraction of the cavity as it became filled with granulations. Even then the ultimate results were better than were obtained without the use of something to replace the vitreous. He had therefore substituted the use of powdered iodoform packed loosely into the cavity of the sclera for the glass globes. After some weeks the iodoform mass was expelled, and there seemed to be the same gain in the final stump; there was no suppuration.

Cross[2] reports eight cases of evisceration with artificial vitreous. In five of these cases the glass ball was used, and in three the hollow silver ball; while in all but three very marked reaction occurred, three were successful, five unsuccessful (ultimately).

In one case, the patient having left the hospital at the end of the thirteenth day, the glass eye was worn from May until October, when the conjunctiva became inflamed resulting in an abscess, later the ball was found slightly exposed with black tingeing of the tissues. The ball was removed.

In one case sympathetic ophthalmia is said to have resulted from an eight days' exposure of the ball, and seventeen days after operation, the ball was removed. In the last, sympathetic ophthalmia came on

[1] Journal of the American Medical Association, October 12, 1889.
[2] Transactions of the Ophthalmological Society of the United Kingdom.

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twenty-one days after operation, directly after exposure to sunlight, and the ball was removed.

In Cases V and VI the ball was at once removed through an existing fistula. The stumps in four cases were excellent,—the maintenance of a deep inferior sulcus at the fornix conjunctiva is, in the opinion of Mr. Cross, the essential factor in keeping the proper position of the false eye. He notes that the movements of the stump were distinctly superior to those of the false eye upon it.

Lang[1] suggested a modification of Mr. Mules's operation by the introduction of the artificial vitreous into the capsule of Tenon, claiming as its advantages,—

(1) Less local and general reaction.

(2) More rapid recovery. (Average stay in hospital in Mules's operation having been in his experience twenty-four days.)

(3) The eyeball is of use for anatomical or pathological purposes.

(4) In Mules's operation the inability to remove the lamina fusca from the sclerotic rendered the operation useless as a preventive of sympathetic ophthalmia.

These conclusions were based upon eight eviscerations with insertion of glass balls. He afterwards substituted celluloid for glass globes, and in private operations preferred Mr. Keall's hollow silver globes. Mr. Lang reported sixteen cases, all having done well but two.

Frost[2] independently advocated a similar procedure, agreeing with Mr. Lang as to the slight reaction compared with the Mules operation, but was less enthusiastic over the results; one great objection being the difficulty of controlling hemorrhage as compared with evisceration. In some cases for this reason it was impossible to insert the artificial vitreous.

This modification has not come into general favor, although Nettleship reports five cases upon which he operated with two successes, in one of which the ball afterwards became displaced.

The case upon which I have recently performed the Mules operation was one of increasing anterior staphyloma of the left eye.

Florence R., aged 10, had been for three years past subject to attacks of severe ulcerative keratitis dating from scarlet fever.

Perforation, prolapse of iris, with, from time to time increasing attenuation of the corneal wall, the outcome of the increased pressure, had produced a total spherical corneal staphyloma. When I first saw the child it was not possible to close the lids over the protuberance, and it had not been for one year. Naturally the circumcorneal and conjunctival injections were marked. No progress was made under the

[1] Transactions of the Ophthalmological Society of the United Kingdom, Vol. VII.
[2] Paper before the British Medical Association at Brighton, 1886.

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use of eserine and pressure bandage, but despite both the projection increased, and on several occasions she complained of moderate dread of light in the good eye.

Operation was advised and performed on December 16, 1894, with the kind assistance of my colleague, Dr. Heyl. The patient was kept as quiet as possible for several days previous to the operation. The face was washed four times each day with soap and water, followed by a solution of bichloride of mercury (1-2000), and the conjunctival sac treated at the same intervals with a bichloride solution (1-5000). The nostrils were carefully cleansed by atomization three times daily with an antiseptic solution, and after etherization the operation was performed as follows:

A stop-speculum was introduced and the conjunctiva well dissected from its corneo-scleral attachment in all directions to the equator of the ball, the muscles, of course, not being touched. The ball was transfixed and an upward section made with a Graefe cataract knife at the corneo-scleral junction, involving the upper third of the cornea.

The corneal section was then completed with a small scissors. The entire interior of the globe was next removed with a scoop, and the sclera left absolutely white and clean. The hemorrhage, which is apt to be considerable, was controlled by the constant application of a hot astringent antiseptic solution, consisting essentially of bichloride of mercury and sulphocarbolate of zinc.

Several times during the operation it was necessary to pack the scleral cavity with sterilized gauze saturated with the solution to which reference has been made. As the operation was done in the operation-room of the Episcopal Hospital, it was possible to condense a very powerful artificial light into the scleral cavity in order to ascertain that every particle of its contents had been removed.

A small cut, four millimetres in length, was made in the sclera at the upper and lower corneo-scleral margins to permit the easier introduction of the hollow sterilized glass ball. A size smaller was selected than one which could have been inserted with a slight effort. In my judgment, want of care at this juncture is the probable cause of failure in several reported cases in which the scleral stitches have broken.

This procedure (the introduction of the ball) is accomplished with an ingenious instrument, especially devised for the purpose by Mr. Mules.

Brudenell Carter inserts a rubber bulb which he inflates within the cavity of the sclera for the purpose of producing pressure upon the central retinal vessels, and thus controlling hemorrhage. This I did not use, but am told by Dr. Risley that it has been entirely successful in Dr. Carter's hands.

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The sclera was stitched vertically, the conjunctiva horizontally.

In order to secure a satisfactory approximation of the concave-scleral edges after the central suture was inserted, the overlapping borders were trimmed. Five sutures were used in uniting the sclera and five in uniting the conjunctiva. The eye was now flooded with the bichloride and sulphocarbolate of zinc solution, dusted with iodoform, and a sterilized compress and bandage applied. All instruments were sterilized, and just before using were placed in absolute alcohol and finally in boiling distilled water.

The diet was confined to liquid. The bandage was removed daily, and a bichloride wash and powdered iodoform applied.

The case made an almost uninterrupted recovery. There was scarcely any reaction. The lids were not at any time swollen, and the conjunctiva but very slightly chemotic. The temperature on the second day reached $99\frac{2}{5}°$ F., falling to normal on the third day, and there remaining. On the fourth day one of the conjunctival sutures ulcerated out. This I attributed to failute to keep the good eye bandaged on the second and third days, thus permitting too much rolling of the eye operated upon. The case was ready to be discharged on the tenth day, but, in order to make assurance doubly sure, was kept an extra week. The artificial eye was inserted January 12, 1895.

The result is most gratifying, cosmetically considered, wellnigh perfect. The artificial eye stands out satisfactorily, the movement is excellent, all secretion is absent, and the lachrymal puncta are kept in proper contact with the artificial eye. There will be unquestionably a better development of the left side of the face than would have been possible after enucleation.

It seems probable, as suggested by Mr. Jessup, that no tissue in the body, because of its low vascularity, will as well withstand the pressure of a foreign body as the sclerotic.

The ball is embedded in soft and yielding tissues, and any direct violence that would rupture the artificial vitreous would doubtless rupture the normal eyeball. However, should such an accident occur, immediate enucleation would be necessary.

R. Brudenell Carter[1] reports thirteen cases, the operations having been done in two eyes for intra-ocular tumor, one for chronic glaucoma, four for loss of sight by chronic inflammation, five which had sustained injury, and upon one disorganized by acute inflammation supposed to have been connected with sunstroke.

Carter washes the conjunctival sac with 20-per-cent. solution of boroglyceride, and, in addition to the use of the scoop and rubber bulb, removes every vestige of ciliary body and choroid by a very small

[1] Medical Press and Circular, August 17, 1887.

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sponge fixed to a handle. He unites the opening horizontally with stout silk sutures, three usually being sufficient, the silk first being soaked in a solution of one part of salicylic acid, one part of glycerin, and nine of alcohol, and the needles are passed through all structures (conjunctiva, subconjunctival tissues, and sclera) at a "good distance from the margin." He then, following Mr. Mules's later suggestion, makes a scissors-cut through the conjunctiva, and introduces a drain of three horse-hairs back to the equator of the ball between conjunctiva and sclera.

If there is much subsequent swelling, and the conjunctiva protrudes between the lids, he paints the protruding part with cocaine and freely punctures with a cataract-knife.

Sutures are removed in from a week to ten days. Of his original series, four were unsuccessful as regards union and two partially successful. In one of the latter a smaller ball had to be inserted. The remaining seven were entirely successful. He prefers silk to catgut, and regards the stump even in the unsuccessful cases as infinitely superior to those secured by enucleation.

In his experience, the statement of Dr. D'Oench, of New York, in connection with the report of 500 cases of enucleation in Knapp's clinic, that the eviscerated stump will contract and its movement become more and more restricted, is never true.

The limit of contraction is usually reached in a short time, and, certainly when an artificial vitreous is inserted, the size of the stump is determined by the size of the ball.

Mr. Carter uses the method even in intra-ocular growths, except gliomata, claiming in the case of sarcomata that the tendency to recurrence is not in the orbit but in distant parts, especially in the liver, and that, as the eye tumor is situated in the uvea, there is no tissue passing out of the eyeball with which it has any structural connection.

He believes Mr. Cross's two published cases of sympathetic ophthalmitis were not due to insertion of the glass ball, as in each of these cases the scleral edges did not unite and the horse-hair drain was not used. In none of Mr. Carter's cases had the slightest irritation been produced, and at the time of this article the first case had been operated upon nineteen months. He has since done the operation a number of times, and is quite as enthusiastic as when he originally stated, "we are indebted to Mr. Mules for one of the most remarkable and valuable improvements in modern ophthalmic surgery."

Dr. L. Webster Fox,[1] of this city, reports four cases, the former two done in 1885, in which the reaction was so intense (temperature in one 105° F., and in the second 105.5° F.) that he removed the glass

[1] Codex Medicus, December, 1894.

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balls and later enucleated; the results in the last two being entirely satisfactory, the highest temperature being 102° F. and 101° F. respectively.

Dr. Fox is enthusiastic over the results, and has seen several cases operated upon by Mr. T. H. Bickerton, of Liverpool, that are equally gratifying.

As the two special instruments and the ball necessary for the operation had not reached me from London at the time the child presented herself for treatment, I am indebted to Dr. Fox for generously placing his supply at my disposal.

REPORT OF A CASE OF CANCER OF THE PYLORIC END OF THE STOMACH, ASSOCIATED WITH GALL-STONES, AND A PEDICULATED TUMOR OF THE PERITONEUM (ANGIO-LIPOMA).[1]

By David Riesman, M.D.,

Assistant Demonstrator of Pathological Histology, University of Pennsylvania; Instructor in Clinical Diagnosis, Philadelphia Polyclinic; Attending Physician for Nervous Diseases, Northern Dispensary.

The case here reported was seen with Dr. Clark, of Philadelphia, to whom I am indebted for the history and for the privilege of making the autopsy.

Mrs. C. W., aged 44 years, German, married, had always been in good health until the beginning of her present illness. Her parents died of kidney disease. She has had five children; no miscarriages. Early in March of the present year (1894) she fell over a chair, and was seized almost immediately afterwards with an attack resembling acute gastritis. It was characterized by sharp, cramp-like pain in the epigastrium, and by the vomiting of a dark liquid, which, as far as she could judge, did not contain blood. She was in bed for two weeks, but the vomiting did not cease, and it has since occurred quite regularly, two or three times daily, sometimes soon after the meal, at others not until several hours had elapsed. The bowels were constipated. There was some tenderness at the pit of the stomach. The urine was pale, acid, and had a specific gravity of 1010; there was a trace of albumin; sugar was absent. On microscopic examination a few granular and hyaline casts and some epithelial cells were found.

[1] The substance of a paper read before the Philadelphia Pathological Society, September, 1894.

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I saw the patient in June. She was a woman of medium height, very obese, weighing, according to her own statement, nearly 200 pounds. The skin was of a uniform pale color, with a faint suggestion of yellow. The abdomen was large and flabby; there was no tenderness anywhere; a tumor could not be felt; the liver and spleen were not enlarged; the heart-sounds were weak, probably on account of the overlying fat interfering with their transmission. The knee-jerks were present; there was no ankle-clonus.

She was then vomiting several times daily, usually about an hour or two after meals. Her chief complaint was an intense, prostrating weakness, which prevented her from leaving the bed. She also had pain in the back, to the right of the lower dorsal spine.

The striking features of the case at this time were the persistent vomiting, without the presence of epigastric tenderness, the extreme debility, and the absence of emaciation.

In discussing the diagnosis, malignant disease of the stomach, Addison's disease, and pernicious anemia were considered. The last was soon abandoned.

By administering predigested food in small quantities Dr. Clark was able to diminish the frequency of the vomiting. The patient, however, continued to lose strength. When I saw her again, in the latter part of August, she was very feeble, but had no pain, and the vomiting was less frequent. She had lost but little flesh in the two months during which I had not seen her, yet she was now distinctly cachectic, the skin being yellowish, waxy, and opaque. At the junction of the forehead and the hairy scalp there was a narrow, pearly-white line, which contrasted rather strikingly with the yellowish pallor of the remainder of the face. An extensive subcutaneous edema of the trunk and lower limbs was also noted.

The abdomen was not tender; a tumor could nowhere be detected; auscultatory percussion of the stomach showed that the organ was not dilated. During the last few days of her life the patient manifested a mild delirium, which was occasionally interrupted by loud, piercing cries, particularly at night. In her lucid moments she complained of dyspnea. A blood count (Thoma-Zeiss) gave 3,512,500 red corpuscles in the cubic millimetre.

A diagnosis of carcinoma of the stomach was made, and in view of the absence of dilatation, the growth was assumed to be a diffuse infiltrating cancer.

The patient died on August 28, 1894, approximately six months after the beginning of her illness.

The *necropsy* was made nine hours after death.

Body of a middle-aged woman of medium height, cachectic in appearance, not much emaciated.

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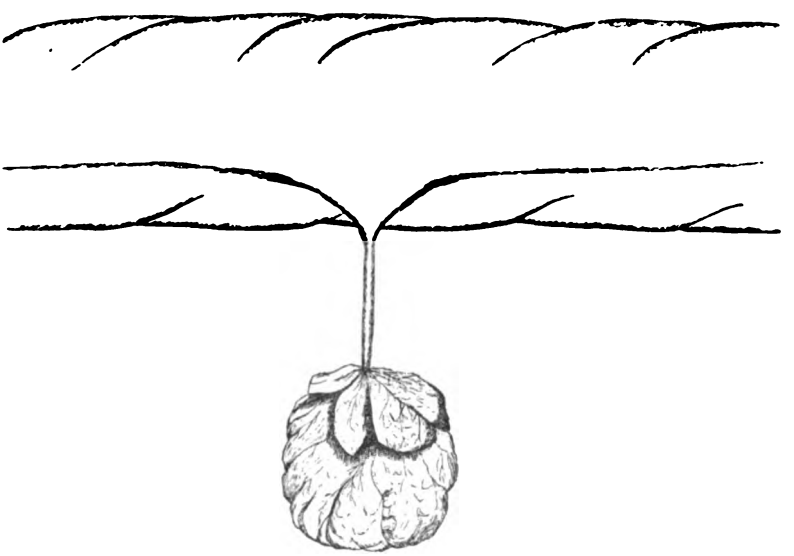
Abdomen.—A large amount of subcutaneous fat of normal color; liver not enlarged; stomach not dilated; the appendix is short and overhangs the pelvic brim. Just beneath the transverse colon, pendent from its posterior surface, and lying in contact with the mesentery, is a peculiar, flat, fleshy, lobulated body, the size and shape of a small fig, three centimetres in diameter, and about three millimetres thick. It is attached to the transverse colon by a slender pedicle, which seems to give passage to and chiefly to consist of a blood-vessel. (Fig. 1.)

The body is dark-red in color, soft, and by drawing on the serous coat of the transverse colon, with which the stalk is directly continuous, has produced a small fold on the peritoneal surface of the bowel.

FIG. 1.



Pediculated tumor of the transverse colon, a little smaller than natural size. The fold produced on the peritoneal coat by the traction of the growth is shown.

The mesentery and omentum are extremely fatty. The pyloric end of the *stomach* is the seat of a firm, elastic growth, feeling not unlike a thick piece of tendon. On opening the organ the tumor is found to encroach very decidedly on the lumen of the pylorus, without, however, completely occluding it. Water flows from the stomach into the duodenum quite readily. The growth extends completely around the stomach, and in a longitudinal direction infiltrates fully two-fifths of the walls of the organ. The infiltration, on the internal surface, measures seventy-three millimetres in a line from the pylorus to the fundus, and on section is twelve millimetres thick.

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In section three concentric zones are visible with the naked eye,—

(1) The mucous membrane, which over the growth is apparently the same as elsewhere in the stomach.

(2) A dense, opaque, whitish layer, and

(3) A translucent zone, just beneath the peritoneum, yellowish in color, and resembling colloid, but firm to the touch.

The three layers are nearly of equal width. The internal surface of the tumor presents only a small erosion; there are no evidences of hemorrhage; the peritoneum corresponding to the tumor is normal in appearance, as is also that covering the remaining part of the stomach.

Secondary cancer-nodules are disposed along the lesser and greater curvatures of the stomach, particularly the former. The fundus shows several prominent veins and a few ecchymotic spots. The *liver* is apparently normal; there are no metastatic deposits. The *gall-bladder* is sausage-shaped, ten and a half centimetres long, and almost completely filled with gall-stones of varying sizes, the largest being as big as a small cherry. Its walls are slightly thickened; there is no bile present, but only a little glairy mucus. The ducts are patulous. A few small stones were lost; those collected numbered 605, and weighed 10.23 grams. The *pancreas* and *spleen* are normal.

On each side of the middle lumbar vertebræ there is a small tumor, apparently an enlarged and cancerous lymphatic gland. The *kidneys* show slight interstitial changes. The *uterus* contains a small, intramural fibroid. Beyond the existence of extensive pleural adhesions, the thoracic organs present nothing abnormal.

Pathologic Diagnosis.—Cancer of the pyloric end of the stomach, with secondary deposits along both curvatures and in the deep abdominal lymphatic glands; gall-stones; a pediculated tumor attached to the transverse colon; early interstitial nephritis; chronic pleurisy; uterine fibroid.

Microscopic Examination —Sections of the growth, taken from the neighborhood of the pylorus, show a total absence of the glandular structure proper to the stomach, the cancer coming directly to the surface. There is considerable degeneration, probably mucoid, both of the stroma and of the cancer-cells. On account of this, the type of the growth is not readily determined. The secondary nodules, however, show very perfectly the features of a columnar-celled carcinoma, the so-called *cylindrical epithelioma.* Resting on the connective-tissue stroma is a row of tall columnar cells with large vesicular nuclei; upon this row a few smaller cells, also columnar, are irregularly disposed, leaving a central lumen.

The general arrangement is suggestive of adenomatous structure, the nests resembling sections of the peptic glands of the stomach.

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In the sections from the gall-bladder we find here and there in the submucous tissue small collections of round cells. Macroscopically, the organ presented, aside from a slight degree of uniform thickening, nothing abnormal, in spite of the presence of gall-stones. Attention has been called by Carter to the existence of these small inflammatory foci in the walls of gall-bladders containing concretions. They may be found when the naked-eye appearance of the organ is normal.

The histologic structure of the peritoneal polyp is as follows: The ground-work is ordinary, reticulated adipose tissue, after the type of the omental fat, with very large fat-cells. Permeating the section in all directions are numerous dilated blood-vessels, filled with red corpuscles. The vessels, which appear both in longitudinal and in transverse section (see Fig. 2), are quite regular in outline, and have walls

FIG. 2.

Microscopic section of the peritoneal tumor, showing the features of an angio-lipoma: blood-vessels and fat. Tissue preserved in Müller's fluid, hardened in alcohol, imbedded in celloidin, stained with hematoxylin. Magnification 90 diametres.

of fibrous connective tissue in which but few cells are visible. In some parts of the field the vessels occur singly, in others a large number are aggregated as represented in the sketch. There are also areas in which the blood is not confined in vessels, but is effused into the substance of the tumor in the nature of a hemorrhage, probably from diapedesis.

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At the periphery there is a thin layer of delicate fibrillar tissue, forming a sort of capsule for the tumor. It is in part stained blue by Weigert's fibrin-stain, and, hence, is probably fibrin deposited from the peritoneal fluid.

The growth is, then, a fatty tumor in which the blood-vessels have undergone telangiectatic change, and is properly termed an *angio-lipoma.*

The uterine tumor has the structure of the ordinary fibroid.

Remarks.—There are a few features in this case that merit a brief discussion. First, the abrupt development of symptoms of gastric disorder after an injury. It is not possible to say what relation, if any, the trauma bore to the incidence of the malignant disease,—the existence of some connection cannot be entirely denied. We know that in cases of tumors on or near surfaces, there is not rarely a history of an antecedent injury at the site of the growth. What part traumatic lesions play in the etiology of primary visceral tumors remains as yet a very obscure problem.

Secondly, the absence of emaciation, notwithstanding the profound malassimilation produced by the long-continued vomiting. No forms of cancer give rise habitually to such extreme loss of flesh as those of the digestive tract. This is pre-eminently true of the tumors located at the cardia and at the pylorus. In our case, although the debility was most pronounced, the wasting was of light degree. The loss of tissue in carcinomatous disease, according to Von Noorden, affects especially the muscles. Generally, there is a proportionate diminution in the subcutaneous fat, but there are, as he states, and as is illustrated by the present instance, exceptional cases, in which, for some undetermined reason, the patients become prostrated without suffering any marked decrease in the adipose tissue.

The third point of interest is the coexistence of cancer and gall-stones, an occurrence to which attention has been called by several writers, and of which an instance was reported some years ago, by Henry,[2] to the Philadelphia Pathological Society. There is, however, a difference of opinion as to the frequency of this association. Williams[3] maintains that gall-stones are more common in persons perishing of cancer than in those dying of other diseases. This is particularly the case in cancer of the breast. Beadles,[4] on the contrary, holds the opposite view; he found gall-stones only three times in sixty-eight autopsies on cases of malignant disease. The question is of some importance; it could readily be settled by a collective study of autopsy records.

[1] Lehrbuch der Pathologie des Stoffwechsels, p. 456.

[2] Transactions of the Philadelphia Pathological Society, 1874–75, Vol. XXVII.

[3] W. Roger Williams, British Medical Journal, August 26, 1893; Medical Chronicle, March, 1893.

[4] Beadles, British Medical Journal, 1893, II, 555.

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Of greatest interest in this case is the peculiar pediculated growth hanging from the transverse colon. The tumor, which is a rare type of peritoneal neoplasm, bears a strong resemblance to, if it is not an early stage of, the free bodies that are occasionally found in the abdominal as well as in other serous cavities, and of which a considerable number have been reported. In some instances both a stalked and a free tumor have been present in the same case. Thus Greenhow[1] records a case in which a small tumor, the size of a hemp-seed, was found attached to the great omentum by a fine pedicle, while a free mass as large as a hen's egg was lodged in a pouch formed by an invagination of the stomach. He also describes a specimen,[2] preserved in St. Bartholomew's Hospital Museum, which resembles the writer's very closely. It was a small, oval tumor, about the size of an almond, attached to the surface of the large intestine by a narrow pedicle that had the appearance of being twisted. In a case recorded by Van der Byl[3] the tumor, which was attached to the transverse colon, consisted of an altered epiploic appendix, and was dark in color from the presence of blood, being similar in the latter feature to the one here reported.

It is generally accepted that the majority of free bodies, at least those found in the abdominal cavity, were at one time attached, and that the pedicle was disrupted through friction, torsion, or traction. In some cases it is possible to find on the tumor a roughened place indicating the point of attachment of the stalk. The tumors vary in size from minute nodules to bodies as large as a pigeon's or hen's egg. They are generally smooth, shining, and hard, and on section are, as a rule, seen to consist of three concentric zones,—(1) an outer fibrous coat, which some hold to be fibrin deposited from the peritoneal fluid; (2) a middle layer of calcareous, gritty material; and (3) a central nucleus of a structureless substance, chiefly fatty. When found unattached, the bodies usually lie loose in the abdominal cavity; in some cases they were found in hernial sacs; in one of Greenhow's[4] cases the body occupied a cul-de-sac formed by an invagination of the cardiac end of the stomach. Virchow[5] has found them situated in depressions on the surface of the liver. They have been met with in other serous cavities; Wardrop[6] found them in the pleural sac. Many of the floating bodies in joints, but not all, are analogous to the loose bodies occurring in the peritoneal cavity. Occasionally they are seen

[1] Greenhow, Transactions of the London Pathological Society, 1872, XXIII, 241.
[2] Greenhow, loc. cit.
[3] Van der Byl, Transactions of the London Pathological Society, VIII.
[4] Greenhow, loc. cit.
[5] Virchow, Die Krankhaften Geschwülste, 1863, Vol. I, p. 382.
[6] Wardrop, quoted by Greenhow, loc. cit.

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in the tunica vaginalis testis, in the arachnoid and the ventricles of the brain (Rokitansky[1]).

The only free body that I have seen was found at an autopsy, performed by Dr. Cattell at the Philadelphia Hospital, some years ago. It lay loose in the peritoneal cavity, was oval, smooth, about the size of a cherry, and had the appearance of a hard fibroma. Free tumors of large size are occasionally found in the abdomen of the horse.

The point of the attachment of the stalked tumors is generally to the colon, but they may be connected with the omentum or the small intestine.

Regarding the origin of the tumors, both the free and the attached, the explanation advanced by Virchow[2] and by Rokitansky[3] is the most plausible. The tumors are primarily developed within the subserous cellular tissue; as they continue to grow they push the peritoneum before them, and in time become polypi, the pedicle being formed by peritoneum. The stalk gradually lengthens and thins out; the vessels atrophy. Finally the pedicle breaks, and the body falls loose into the peritoneal cavity. In many instances the bodies are either transformed epiploic appendices or are developed within them; according to Wilks,[4] from lymphatic glands, which he believes to exist in some appendices. Subperitoneal fibroids of the uterus may become stalked and eventually, from rupture of the attenuated pedicle, free.

The origin of our tumor was clearly not from an appendix epiploica, since it was attached at a considerable distance from and above the line of the appendices.

It is most reasonable to suppose that the body originated as a lipoma in the wall of the intestine, probably in the subserous tissue, and became pediculated in the manner described.

The majority of tumors present calcareous infiltration. This is wanting in our case, presumably on account of the free blood-supply to the tissues of the growth.

[1] Rokitansky, New Sydenham Society's Translation, Vol. III, p. 41.

[2] Virchow, loc. cit.

[3] Rokitansky, loc. cit.

[4] Wilks, Transactions of the London Pathological Society, VIII, p. 214. Tumors of this kind have also been reported by Nesbitt, Transactions of the London Pathological Society, XII, p. 89; Murchison, Ibid., XV, p. 96; Show, Ibid., VI, p. 204; Ogle, Ibid., VI, p. 208; Van der Byl, Ibid., VI, p. 211; Hughes Bennet, Ibid., VIII, p. 212; Brown, Ibid., VIII, p. 214; Canton, Lancet, 1850, I, p. 187; Eve, Transactions of the London Pathological Society, XXXI, p. 311; and by others.

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MEMORANDA.

ISCHIOPAGUS.

[Presented to the Wistar Museum by Dr. E. W. Cook, Plattsmouth, Nebraska.]

The two bodies in ischiopagus are joined by the coccyges and sacra. The spinal columns have about the same axis. The composite pelvis is composed of the four innominate bones, by the junction of the right pubic bone of one infant to the left pubic bone of the other on one side, and the left to the right on the other. The two bodies are distinct and separate, each possessing its normal parts and organs, but the pelvic viscera are likely to be fused, and the external genitalia lying between the limbs on each side of the pelvic region are composed of the right half of one infant's genitalia and the left half of the other. Thus, in the female, the right and left labia majora belong not to one individual, but one to each. So with the two halves of the penis and scrotum, although the symmetrical and normal appearance of the parts would not suggest their dual ownership. The lower limbs, also, on each side, although symmetrical in appearance, and lying naturally together, are supplied on the right and left sides by the corresponding bodies. The lower limbs are not usually equally well developed, but even so they are symmetrical. Thus, on one side, there will be two well-formed legs each belonging to a separate body, and on the other the two limbs will be fused into a single ill-developed one (*ischiopagus tripus*). In this case the genitalia are, of course, lacking on the ill-developed side. In other specimens there will be two legs on one side, none on the other (*ischiopagus dipus*).

In many specimens there is atresia of the urethra and anus, at least on one side, and very likely on both. It is mainly on this account that the ischiopagi do not long survive birth.

In exceptional cases there seems to be no reason why long-continued existence is impossible; but, as a matter of fact, I know of but one ischiopagus which lived beyond the first year.

The delivery of these infants is usually easy. The head, shoulders, and trunk of one child are born; then the legs of both, and, lastly, the trunk, shoulders, and head of the remaining infant. There is only one cord and umbilicus.

Ischiopagi are not very rare. Twenty cases were collected by Förster, Ahlfeld adds a number of others, and there are nine references to the subject in the *Index Medicus* since 1879.

The specimen presented by Dr. Cook, however, is the only one the

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ISCHIOPAGUS. (Front view.)

ISCHIOPAGUS. (Rear view.)

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recovery in about seven weeks. It has since, however, been readmitted (September 9, 1894) with a reaccumulation of pus small in amount.

The above case is interesting from the fact that the infection was direct and clearly from the pus of the empyema, yet Dr. S. developed a typical case of facial erysipelas. The bacteriologic examination of the pus from the empyema showed only the streptococcus pyogenes.

The case seems to me to afford very strong clinical evidence of the identity of the streptococcus erysipelatis with the streptococcus pyogenes.

JOHN P. ARNOLD, M.D.,
Superintendent, Presbyterian Hospital, Philadelphia.

SPASMODIC STRICTURE OF THE ESOPHAGUS CAUSED BY NASAL POLYPI.

J. H., German, aged 69 years, of splendid physique and formerly of excellent general health, was examined December 31, 1893. He had been afflicted with a cough for some years, due no doubt to laryngitis caused by nasal stenosis. Snuff-taking had been doubtless a factor in causing naso-pharyngeal catarrh. For many years his voice had lacked nasal resonance, and he had felt something flopping about in his nose. Of late nasal respiration was entirely shut off.

For six weeks he had noticed difficulty in swallowing, which had gradually increased until it amounted to inability to swallow solids of any kind. If fluids were taken, part would be returned into the mouth almost invariably. There was considerable pain in the upper part of the gullet, not only at the time of deglutition, but in the interval as well.

He having been a moderate but steady whiskey-drinker and having seen several cases of cancer of the esophagus recently that might be rationally attributed to taking whiskey "straight," I was inclined to think that this was a neoplastic stricture. His condition was becoming serious, and weakness and anxiety pronounced.

The operation for removal of polypi was made to relieve him of his headaches and the discomforts incident to mouth-breathing, but without real hope of influencing the esophageal trouble. One very large polypus occupied the whole of the left nasal cavity, and it had to be removed piecemeal. A few small ones were found in superior meatus. The left side was blocked by hypertrophies. He was given a cleansing douche, and snuff and irritant drinks were interdicted.

In two days he announced that he could swallow quite as well as ever, solids and fluids alike. Pain disappeared, and also the frontal

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headache and mental hebetude incident to the congested frontal and ethmoidal sinuses.

The pathology of this case of spasmodic stricture is apparently simple. The nasal stenosis was complete. No air could be forced through. Consequently the volume of air in the mouth and throat at the time of attempted deglutition was forced downward with the bolus of food instead of escaping through the naso-pharynx and nares. This so disturbed the normal co-ordinated action of the muscles of deglutition that the result was rejection of solids and a portion of the liquids. It was the more remarkable that such disturbance of co-ordination should have occurred in a man of phlegmatic temperament.

THOMAS HUBBARD, M.D.

TOLEDO, OHIO.

CURIOUS OBSTETRIC COINCIDENCE.

ON January 17, 1895, I was called to attend Mrs. Nicholas B. in confinement. On the same day my brother, Dr. F. E. Henry, was called to attend Mrs. John B., also in confinement. Each gave birth to a girl; one was born at 11 A.M., the other 11.25 A.M.

Nicholas B. and John B. are brothers; their wives are sisters; the children are of the same sex, and were born within half an hour of each other; and the physicians who were in attendance are brothers.

T. J. HENRY.

APOLLO, PA.

ALUMNI NOTES.

THE MEETING OF THE PHILADELPHIA ALUMNI SOCIETY OF THE UNIVERSITY OF PENNSYLVANIA.

ON Saturday evening, March 2, 1895, the Philadelphia Alumni Society gave an enjoyable "smoker" at the Colonnade Hotel, Philadelphia. The University Glee-Club furnished a number of selections. Among the speakers were Dr. William Osler, of Johns Hopkins University, Dr. Horatio C. Wood, Dr. J. William White, Dr. John H. Musser, and Dr. John H. Chestnut. Dr. Reginald Fitz, of Harvard University, was present as a guest.

THE DORMITORIES.

DURING the month of February $30,000 were contributed to the University, to be applied to the erection of the new dormitories. Messrs.

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Cope and Stewartson, architects, have announced that the working plans for the new buildings have been almost completed, and the contract will be shortly awarded. Work will begin on the triangle, west of the old athletic grounds, not later than June 1, and in a year from then the first part of the new dormitories will be ready for occupancy, and will accommodate 300 students.

THE RELATIVE STANDING OF UNIVERSITY GRADUATES IN THE NEW JERSEY STATE BOARD EXAMINATION.

THE figures in parentheses give the relative standings of the schools in the respective branches.

College.	Chemistry.	Physiology.	Obstetrics.	Therapeutics.	Surgery.	Practice.	Anatomy.	General Average.
University of Pennsylvania . .	82.2 (1)	85.1 (1)	94.6 (1)	93.6 (1)	87.1 (2)	69.9 (2)	91.4 (3)	86.3
Jefferson	71.9 (5)	79.7 (4)	85.1 (5)	92.6 (4)	84.2 (4)	66 8 (5)	86.6 (5)	80.98
University of New York	81.6 (2)	78.8 (5)	92.8 (3)	92.8 (3)	83.1 (5)	67.7 (4)	88.7 (4)	83.64
Bellevue	82.2 (3)	84.2 (2)	88.8 (4)	91.3 (5)	86.2 (3)	69.3 (3)	92.2 (2)	84.88
Columbia	80.5 (4)	80.9 (3)	93.7 (2)	93.6 (1)	87.2 (1)	73.4 (1)	92.6 (1)	85.98
Average	79.7	81.7	91.0	92.8	85.8	69.4	90.3	

DR. S. PALMER LLOYD, Class of 1893, was elected City Physician of Savannah, Ga., January 28, 1895.

DR. DAVID CERNA, Class of 1879, formerly Demonstrator of Experimental Therapeutics and Lecturer on the same at the University of Pennsylvania, and more recently Demonstrator of Physiology and Lecturer on the History of Medicine in the Medical Department of the University of Texas, has resigned from his positions in the latter institution, and will hereafter reside upon estates in Mexico, recently inherited by the death of his father.

NECROLOGY.

DR. ROBERT RANDOLPH TAYLOR died February 26, 1895, in Philadelphia, in the 70th year of his age. Dr. Taylor was born in Edgewood, Hanover County, Virginia. He studied first in the University of Virginia, and after graduating from that institution came to the University of Pennsylvania, where he received his medical degree. At the outbreak of the war he enlisted in the Fourth Iowa Cavalry, and did active duty in the field. Towards the close of the struggle he was in charge of both the Hestonville and Federal Street Hospitals, in Philadelphia. At the end of the war he resumed the practice of his profession in the latter city, and continued it uninterruptedly until his death.

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EDITORIAL

FUTURE LINES OF DEVELOPMENT IN MEDICAL EDUCATION.

At the meeting of the Philadelphia Alumni of the Medical Department of the University of Pennsylvania on February 24, Professor William Osler, of Johns Hopkins University, spoke of the splendid stand for higher medical education which had been made by the Universities of Pennsylvania and Harvard, and by the College of Physicians and Surgeons of New York City. At one time, he said, it was feared that lengthening of the course from three to four years would result in a large reduction in the number of matriculates; now it is evident that the profession is so ripe for the longer course that the schools which have been prominently identified with it will have more students than can be accommodated under existing conditions. Dr. Osler predicted that within ten years it would become the custom, about this time every year, to send out notices to the effect that the University was ready to receive applications from those desiring to enter as students in the Medical Department. The number applying would be so great that a preliminary weeding-out would be necessary.

Regarding the student's qualifications, Dr. Osler declared that he should have had beforehand all his general chemistry and biology, including comparative anatomy and physiology, so as to be able at once to enter his medical studies proper. A medical school should not be asked to teach non-medical subjects. Under this system the student will come to his fourth year fully prepared for exclusively clinical work.

This brings us to the most interesting part of Dr. Osler's subject, —namely, how shall we deal with the enormous classes which soon will demand bedside instruction? One way would be to have a very large hospital and a large corps of instructors and use the patients over and over again, which would be hard upon them and not so satisfactory to the students. Dr. Osler expressed his preference for the plan which has for many years been in successful operation at Edinburgh. At that University a physician may apply to the University Court for appointment as an extra-academical professor in a particular branch. If his qualifications and hospital material are deemed sufficient he may be appointed. Any student is privileged then to take this professor's

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course, the fees go to the professor, and the latter's card entitles the student to present himself for examination. At Edinburgh there are six extra-academical professors in surgery, and five in medicine, besides the regular university professors in these branches. The resulting competition is good for the younger men, who see ahead of them the full professor's chair; and it is still better for the professor, who is stimulated to do his best. But, most important of all, it opens up to students a vastly larger supply of clinical material than could be obtained in any other way.

Of the enormous hospital population of Philadelphia, Dr. Osler thought that not more than ten per cent. were utilized for clinical purposes. By the plan suggested much of this waste material could be saved, to the great benefit of our students, and also of the patients themselves; for, as a rule, a patient in a hospital in which there is teaching is better cared for and more intelligently treated.

Dr. Osler truly said that the adoption of the Edinburgh plan would involve some sacrifice of pride and pocket on the part of our medical faculties. This may be an obstacle in some institutions, but we are persuaded that it will not be in our own, where self-denial and self-sacrifice in the interest of medical advancement are not new. The apparent difficulties at present are two: first, in obtaining the consent of hospital authorities to clinical teaching in their wards, and, second, the fact that our hospitals are scattered over such a vast extent of territory that much time would be lost in travelling from one to another. But neither difficulty is insuperable. Hospital authorities could, in time, be brought to see that it is to the highest interests of the community and of their own patients to aid to the utmost in the acquisition of medical knowledge. It seems to us, also, that it would be perfectly proper that the State, when applied to for aid to hospitals, should couple the grant with a proviso that clinical teaching should be permitted in the wards under suitable regulation. The State has already, in its passage of the bill establishing a State Board of Medical Examiners, insisted that future practising physicians must have higher attainments in knowledge and skill, and by encouraging clinical teaching in hospital wards it would provide the means to this end.

THE PREVENTION OF MYOPIA.

THE large number of children and young adults who are wearing glasses at the present time has been a source of constant wonder to the older portion of our population. If any justification for the army of spectacled children were needed, the findings of a score of skilled ophthalmologists in the public schools of this and other countries

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would seem to amply suffice. Without exception, all observers found a very large percentage of the children in the schools with errors of refraction. The fact, however, which attracted most attention was the progressive increase in the number and degree of the myopic eyes as the higher grades were reached. The reforms that have been introduced to remedy many of the commonly-assigned causes are now so well known that they need not be repeated here. It was found, however, that improvements in the hygiene of the school-room did not result in any diminution in the number of near-sighted eyes nor in the grade of the myopia. The cause of the steady rise in the degree of near-sight in school-children was, therefore, sought within the eye itself. It was thought that those children who entered school with congenital anomalies of refraction would be found later to have developed the progressive myopia which was so uniformly found, and that the early optical correction of these defects would save the eye from further pathological change. If this theory be correct, we should expect to find after a number of years of uniform correction of these defects a reduction both in the number and grade of myopic eyes.

With this thought in mind, Dr. S. D. Risley undertook a study of the percentage of myopia and of myopic astigmatism present in those applying for treatment during the past twenty years (*Archives of Ophthalmology*, No. 3, 1894). The observations include the records of his private case-books and the prescription files of two manufacturing opticians, and embrace nearly 200,000 eyes. The cases were grouped not only according to the degree of myopia, but also into the following periods: 1874 to 1880, 1881 to 1883, 1884 to 1886, 1887 to 1889, and 1890 to 1893. The result shows a marked decrease in all the higher grades of myopia for each successive period. After making allowance for all fallacies that might affect the conclusions, the effect of treatment and glasses is shown unmistakably to have saved innumerable eyes and untold discomfort, not to mention the disadvantages overcome in the competition in school, or later in business or professional pursuits.

It is obvious from the study of this large number of cases that the impression gained in individual experiences is correct, "that we have first the asthenopic eye with hypermetropic astigmatism, then the mixed form, which, if neglected, passes into the simple myopic, and finally into compound myopic astigmatism and progressive near-sight."

Considering "the grave peril which ever waits upon the higher grades of near-sight because of the serious pathological conditions so frequently present," it should be necessary only to mention the subject to awaken the public to a proper appreciation of the importance of the *prevention* of myopia.

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MEDICAL PROGRESS.

MEDICINE.

UNDER THE CHARGE OF

WILLIAM PEPPER, M.D., LL.D., AND JAMES TYSON, M.D.,

ASSISTED BY

M. HOWARD FUSSELL, M.D.

Discussion on Antitoxin.

In the Berlin Medical Society Dr. Schiemmann warned general practitioners against employing the antitoxin, which he thought should as yet be left to the hospitals. Professor O. Liebreich criticised the Berlin statistics on serum therapy. He believed that the Berlin hospitals had so much larger mortality because they received the worst cases, but since serum had been used they received light as well as severe cases, and this lowered the mortality. Dr. Hansemann believed that antitoxin could not be considered a specific against diphtheria.

Transmission of Typhoid Fever by Oysters.

Broadbent (*British Medical Journal*, January 12, 1895) cites nine cases of typhoid fever where he believes the disease was communicated by oysters. They were all cases seen in consultation. All of the cases lived where typhoid was not prevalent. The hygienic surroundings were perfect. In all of the cases oysters had been partaken of freely by the patients. No remarks are made upon the drinking-water.

Apropos of this subject the reader is referred to a humorous article in the *New York Medical Record* of January 19, 1895, by Dr. J. Early-Hustler.

Purpura in Childhood.

Grosz (*Archiv für Kinderheilkunde*, Vol. xviii, 1894) reports fifty-three cases of purpura which occurred in the Stephanie Children's Hospital among a total of 90,556 cases of disease. He concludes,—

(1) In childhood a hemorrhagic diathesis occurs in which hemorrhages appear in the skin, the subcutaneous connective tissue, and various other parts of the organism.

(2) The attacks of purpura can be divided into two groups,—those in which involvement of the joints occur, and those in which there is no joint involvement.

(3) The name purpura comprises cases of purpura simplex, hemorrhagica, and rheumatica.

The course of the attack is only exceptionally accompanied by fever, and is usually without danger to life, though sometimes death occurs through severe anemia, cerebral hemorrhages, etc.

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Ferratin in the Treatment of Anemia.

Kündig (*Deutsches Archiv für klinische Medicin*, Vol. LIII, Parts 5 and 6, 1894) describes the preparation of ferratin and some experiments on animals, which go to show that the preparation is absorbed into the organism. He reports twenty-five cases. In all the cases the appetite improved, and in cases where there was complete anorexia the appetite was regained. This was especially noticeable in cases of phthisis. The drug was easily administered, and did not cause vomiting. The digestion was not interfered with, and it was especially noticeable that the movement of the bowels remained regular. In all cases the anemic symptoms disappeared more quickly than they did after use of other iron preparations. The actual blood condition improved less markedly than the general condition of the patient.

Antispasmin in Whooping-Cough.

Frühwald (*Archiv für Kinderheilkunde*, Vol. XVIII, 1894, Parts 1 and 2) describes antispasmin as a chemical body in which one molecule of narcein sodium is united with three molecules of salicylate of sodium. It is a hypnotic and sedative, and is of especial use in diseases where there is a severe painful spasm. It is a hygroscopic powder easily soluble in water.

He has treated about 200 cases of whooping-cough in individuals from the age of a few months to adults. In every case the results were highly satisfactory.

The number and intensity of the attacks were lessened. The course of the disease was shortened.

The drug was administered in a 5-per-cent. solution. At the age of six months three to five drops were given four times daily; at the age of one year, five to eight drops; and at three years, fifteen to twenty drops four times daily.

Varices of the Esophagus.

Friedreich (*Deutsches Archiv für klinische Medicin*, Vol. LIII, Parts 5 and 6, 1894) says that the veins of the esophagus are divided into two groups, one of which enters the superior cava, and the other the portal vein. In the anastomosis about the esophagus these veins far outnumber the arteries. There is an inner plexus in the submucosa and an outer plexus on the periphery. Both these plexuses anastomose freely. There is a free anastomosis between the portal vein group and the superior cava group, which gives a direct communication between the portal and general venous system. In most of the cases of varices of the esophagus the liver has been the organ affected as the primary cause of the dilatation of the vessels. He reports the following case: A girl, 6 years old, began to be sick when 2½ years old. She began to get weak and pale, and complained of pain in the head and in the region of the liver. There were signs of indigestion. One year before, 1892, the child had a sudden vomiting of blood with continued vomiting and diarrhea. In the following summer the child had another attack of vomiting and diarrhea. October 13, 1893, the child was admitted to hospital with vomiting of blood. There was no abnormality of heart or lungs. The abdomen was distended but not tender. It was thought that the child was suffering from an ulcer of the stomach. In five days another severe attack of hematemesis occurred, this time followed by bloody stools. This was followed in ten days by a typical attack of chorea, which gradually improved as the child gained strength. There were no stomach symptoms after this until the child died of a third attack of hemoptysis.

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At the section the ventricles were dilated and the muscle soft. The endocardium was flecked with spots and stripes of intense yellow color. The pericardium and lungs were normal. The peritoneal cavity contained about a pint of milky fluid. The peritoneum and glands were normal. The liver and the much-enlarged spleen were the seat of fatty degeneration. Section of the portal vein, thoracic duct, and vena azygos were negative. The only positive lesion was an extensive varicose condition of the esophageal veins. They were knotted and thickened and some almost as large as a lead-pencil. The point of bleeding could not be discovered.

Toxic Effects of Diphtheria Antitoxin.

Seibert (*New York Medical Record*, January 19, 1895) records the following case: Lizzie, aged 6½ years, was inoculated with ten cubic centimetres of antitoxin from Pasteur Institute. Nine days after the injection, and after she had entirely recovered from the diphtheria, from which she had previously suffered, she was suddenly covered with a rash, which resembled measles in some spots, and scarlatina in others. Temperature 98.5° F. The next day the erythema disappeared. On the next day, eleventh after the injection, there were nausea, chill, headache, malaria, pains in back of the head. Temperature 104.5° F. The posterior cervical glands were enlarged. There were no throat symptoms. Next day better. On the following day temperature 104.8° F. A new eruption over the face; marked edema of eyelids; face, neck, and extremities covered with small blotches; larger ones over the trunk. All the large joints swollen and tender. On the sixth day the patient was practically well.

This case resembles exactly three others reported by Lublinski and by Scholz in the *Deutsche medicinische Wochenschrift*, November 8 and 15, 1894. The author believes the symptoms were entirely due to antitoxin, for the following reasons:

(1) No local disturbance appeared at the point of injection, thereby excluding the possibility of an unclean syringe.

(2) The erythema appeared exactly ten days after the injection of the antitoxin, exactly the time given in two of the cases quoted.

(3) Swelling and pains in joints and tenderness of muscles and tendons were well marked in all the cases.

(4) The affection persisted in all the cases from four to seven days.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

ASSISTED BY

G. G. DAVIS, M.D., M.R.C.S., AND ELLWOOD R. KIRBY, M.D.

Operation for Depressed Nose.

Ellison (*Lancet*, February 17, 1894) gives the history of a case of depressed nose, in which a metal plate was inserted. He describes the procedure as follows: An incision with a tenotomy knife was made on either side and across the nose a couple of lines below the lower part of the depression. The flap of integ-

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ument thus marked out was raised sufficiently to permit the plate to rest in the position desired on the subjacent tissues. There was very little bleeding, which was easily stopped with hot water. The flap of integument was then drawn over the plate and carefully sutured with horse-hair along the line of the incision; a thread of catgut as a drain was inserted in the lower portion of the incision, and removed after twenty-four hours. Collodion, except over the catgut drain, and gauze was applied as a dressing. Healing occurred by primary union. The patient seven years later stated that she had no inconvenience from the plate whatever, thus establishing the complete success of the operation.

Treatment of Goitre by Exposure to the Air (Exothyropexia).

Poncet (*Le Mercredi Médical*, February 7, 1894) advocates his method of treating goitre by exposing it to the air by means of an incision through the overlying soft parts. He has done this fourteen times and obtained a cure in each case. The operative technique is given in the *Lyon Médical*, March 12, 1893, and the *Bulletin Médical*, March 19, 1893. Subsequent interference with the exposed growth, as cauterization, ablation, excision, curetting, etc., has not been found desirable. The exposed tissue is insensible to pain, but its irritation readily gives rise to fever. It is also liable to suppurate, and in that case healing is long delayed. The exposed gland exudes serum very abundantly for a few days after the operation. The sheaths of the large blood-vessels, however, remain dry. The large veins enlarge and become turgid; soon the color of the goitre darkens, indicating venous stasis. The circulation then stops: until this time the goitre is swollen as if it was distended with blood. On the second day the large veins begin to diminish in size, and on the eighth day their atrophy is complete. Granulations then cover the goitre and the skin becomes adherent around the edges. This may take quite a time to cicatrize and is the only objection to the method. The constitutional symptoms improve as the gland atrophies.

This procedure is curative in itself alone, without any adjuvant. It can be done as an operation of urgency in suffocative cases. It can also be the first stage of an excision, thus permitting that operation to be done with much less loss of blood. It is applicable to all varieties of goitre, and, perhaps, it may be found to be a suitable procedure in Basedow's disease.

Cure of Granulating Surfaces by Transplantation of Large Flaps.

Wm. B. Hopkins showed two cases before the Philadelphia Academy of Surgery, at its meeting on December 3, 1894, of granulating surfaces cured by transplantation of large flaps.

One case was a man, aged 32, with a granulating surface, from laceration, extending from the middle of the arm to the middle of the forearm,—about ninety-six square inches. It was covered by a vertical flap five inches wide and nine inches long, consisting of skin and superficial fascia, the base of which occupied the upper left pectoral region, and the edges of which were nearly parallel. The limb was retained in the Velpeau position. At the end of four days the basal attachment was divided; some epidermal sloughing took place, but the result was excellent. The patient remained in the hospital 279 days, leaving with a soft pliable integument. The wound on the chest was closed as much as possible by approximating its edges.

The other case was in a man, aged 33 years, with a flayed foot. A flap two

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inches wide was dissected from the sound limb, from the lower portion of the thigh to the lower third of the leg, a distance of fourteen inches; it was left attached at its lower part. Carrying the lower portion along the outer side of the foot from before backward, the flap was reflected upon itself around the heel, and its remaining portion carried forward on the inner side of the foot to the toes. The foot was retained by a splint devised by Dr. Ferguson, fixed to the calf of the leg on the sound side for twenty-two days. Before dividing the flap it was dissected off a little farther down the leg. The patient was in the hospital 657 days. The result was excellent. The plantar surface of the foot had hairs on it. The patient worked as a fireman.

THERAPEUTICS.

UNDER THE CHARGE OF

HORATIO C. WOOD, M.D., LL.D., AND ARTHUR A. STEVENS, M.D.

Opium in Epilepsy.

Collins (*Medical Record*, September 22, 1894) has employed the treatment suggested by Professor Flechsig, of Leipsic, in about fifty cases of epilepsy. Briefly, the plan is as follows: The patient is first given one-half to one grain of opium, and this is rapidly increased until at the end of the first week he is taking fifteen grains or more a day, in doses of from one to four grains. At the end of six weeks the opium is entirely suspended, and potassium or sodium bromide (one-half drachm four times daily) is substituted. After these large doses of bromide have been continued for some time, the amount is gradually lowered, until the patient is taking less than forty grains a day. It is important that the bromide should immediately follow the suspension of the large doses of opium. The writer concludes as follows:

(1) The plan suggested by Flechsig is not a specific in the treatment of epilepsy.

(2) In almost every case in which this plan of treatment has been tried there has been a cessation of the fits for a greater or less time.

(3) A relapse generally occurs in a period varying from a few weeks to a few months.

(4) The frequency of fits after the exhibition of opium is, for the first year at least, lessened more than one-half.

(5) The attacks occurring after the relapse are much less severe in character than those that the patient has been accustomed to having.

(6) This plan of treatment is particularly valuable in ancient and intractable cases.

(7) In recent cases of idiopathic epilepsy it cannot be recommended.

(8) The opium plan of treatment is an important adjuvant to the bromide plan as ordinarily applied.

(9) The opium acts symptomatically, and merely prepares the way for and enhances the activity of the bromides and other therapeutic measures.

(10) This plan of treatment permits the use of any other substances which are known to have a beneficial action in epilepsy.

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Chloroform in Gastric Affections.

Stadnitzky (*Vratch*, No. 43, 1894), from his experiments with chloroform administered internally to seven young men, concludes that the drug markedly improves all the functions of the stomach, which fact suggests its value in dyspepsia. In each instance the experiment lasted fourteen days, being divided into two equally long stages, during the second of which the subject was given three to ten drops of the drug three times a day.

Trional.

Claus (*International klinische Rundschau*, No. 45, 1894) speaks highly of trional in the insomnia of children. He believes that it should be avoided in the insomnia of organic brain disease, as meningitis, etc., but finds it especially useful in chorea, convulsions, and night-terrors. Trional is of little service in insomnia due to pain. The doses used by the author were 0.2 gramme to 0.4 gramme for infants from 1 month to 1 year, increased to 1.2 to 1.5 grammes for children from 6 to 10 years. In the insomnia due to toxic influences chloral is more effective.

Quinine in Chorea.

Knapp (*Boston Medical and Surgical Reporter*, February 28, 1895) reports eight cases of chorea in which quinine was administered in doses of from six to eighteen grains a day, the doses being somewhat smaller than those recommended by Dr. Wood. In addition to the quinine the ordinary hygienic measures and regimen ordinarily recommended in chorea were employed. No other medicinal treatment was given, not even cod-liver oil or any malt preparation. The author sums up the results as follows:

"In one case there was complete recovery in a week after treatment was begun, and in a second in three weeks, but, although this is rather a short time, it is not very remarkable for chorea to recover in that period. The third case recovered after being under treatment ten weeks. In five cases the quinine treatment proved ineffectual, and arsenic was substituted, with distinct benefit in the majority of cases. With the exception of one case, which recovered in a week, the results are neither remarkable nor satisfactory."

The writer does not believe that the use of quinine in chorea can be justified on the hypothesis of its action in stimulating the inhibitory motor functions of the spinal cord, and believes that the good it accomplishes results from tonic properties or to some influence which it exerts on the toxine of the disease. Chorea, he asserts, cannot be regarded as a spinal disease. The pronounced cerebral symptoms, and the distribution of choreic movements, which are so often found to affect one side or even one limb predominantly, would of themselves point to the cerebral origin of the disease, even without the evidence afforded by autopsies, which have shown the most marked changes in the cerebral cortex, although the basal ganglia and the cord itself have not been exempt. Choreic movements are not uncommon as a result of structural brain-disease, but they are rarely, if ever, seen as a symptom of disease of the cord. In canine chorea, on the other hand, which is not proven to be the same as human chorea, the changes are chiefly in the cord.

The hypothesis, the writer states, on which quinine is recommended for the treatment of chorea seems to him untenable, and the therapeutic results are based thus far on too few cases to warrant us in ascribing greater virtues to this drug than to arsenic.

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Virchow's View of the New Treatment of Diphtheria.

In the Berlin letter to the *Medical Press and Circular* (*Therapeutic Gazette*), of October 17, 1894, the correspondent states that Virchow's opinion of the efficacy of the new treatment of diphtheria by blood-serum may be thus summarized: The serum exercises a strong protective effect for some weeks, perhaps for even three or four months; but it remains to be seen whether this effect is permanent, and whether—and this is the cardinal question—it is really possible to cure diphtheria by this remedy. Much, however, is gained if we succeed in protecting even one child in a family in which three or four are ill of this malady; and that we may accomplish this appears extremely probable.

The Effect of Levulose on Patients Suffering from Diabetes Mellitus.

Haycraft (*Medical Chronicle*, September, 1894), from experiments on rabbits and observations made on three patients with diabetes to whom levulose was administered, draws the following conclusions:

(1) A patient suffering from chronic diabetes can utilize fifty grammes or more of levulose daily.

(2) In some acute cases a part of the levulose taken with the food is excreted as such, a part is utilized in the body, and a part is transformed into glucose.

(3) In rabbits, glycogen is formed from the levulose taken, and is stored up in the liver.

Hale White records the result of a number of careful experiments on eight diabetic patients with regard to the effect of giving levulose and inulin. Levulose prepared by Von Schering was employed, and inulin in the form of dahlia tubers was given. The following are the conclusions at which he arrives:

(1) If large amounts of levulose are given, some of it appears in the urine.

(2) In none of these cases did levulose have the pernicious effect—often seen with ordinary carbohydrates—of increasing the output of sugar beyond the extra quantity given.

(3) When levulose is given, the excretion of sugar is usually increased, but it may be diminished.

(4) In most cases much less sugar is passed in the urine after giving levulose than would have been excreted if the previous excretion of sugar had remained stationary and all the levulose had appeared in the urine. This result seems to indicate that in these cases some of the levulose given was retained and used up in the body.

(5) There is some evidence that the larger the amount of levulose the less will be the increase of sugar in the urine.

(6) While, therefore, some of these cases show that levulose can be utilized better than dextrose, none of them show that dextrose can be utilized better than levulose.

(7) None of the patients felt worse for taking levulose; indeed, some felt better and gained in weight.

(8) Probably a moderate amount of dahlia tubers, taken as a vegetable by patients suffering from diabetes, would do no harm.

(9) The effect of levulose on the excretion of urea is unimportant.

(10) The amount of urine passed when levulose is given varies with the quantity of sugar passed.

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URICEDIN.

LANGSTEIN (*Prager medicinische Wochenschrift*, No. 45, 1894) concludes from his experiments with uricedin as follows:

(1) In the form of cakes it is not unpalatable.

(2) It has no unpleasant after-effects, even when given in daily doses of 150 grains.

(3) It may, sometimes, act as a cathartic, but this is not undesirable in the lithic acid diathesis, especially as the effect is not disagreeable or painful.

(4) Even after prolonged use it does not irritate the heart or kidneys, as do most remedies for gout.

(5) It has a pronounced diuretic effect.

(6) The action of the drug is somewhat more certain, but not always more rapid, than that of other remedies which favor the elimination of uric acid. It first increases the uric acid in the urine, then lessens it, and, finally, the urine becomes alkaline.

(7) Uricedin also relieves pain.

SALOPHEN IN CHILDREN'S DISEASES.

DREWS (*Allgemeine medicinische Central Zeitschrift*, November, 1894) states that salophen is well taken by children, and does not produce the untoward effects of sodium salicylate. In fifteen cases of acute rheumatism in children of 7 to 14 years of age, he gave three to five grammes *per diem*. The pain abated at the end of the first day in most cases, and subsided in three or four days. In twelve out of fifteen cases the administration of the drug was followed in half an hour by copious perspiration, which, however, had no bad effects on the general condition of the patients. Equally good results were obtained in five cases of acute muscular rheumatism of the neck muscles. In a case of chorea in a girl 13 years of age, in which a slight murmur was present, in twelve days the movements had ceased, and the murmur had disappeared. In this case five grammes *per diem* were given.

He also obtained good results in a case of purpura rheumatica, in several cases of migraine, and in cases of fever (scarlatina, typhoid, croupous pneumonia, etc.) where he employed it as an antipyretic. Drews concludes that salophen has very good antirheumatic properties, and deserves a trial in preference to other drugs; that it is a useful antipyretic and a very good antineuralgic.

OBSTETRICS.

UNDER THE CHARGE OF

BARTON COOKE HIRST, M.D.,

ASSISTED BY

RICHARD C. NORRIS, M.D., AND FRANK W. TALLEY, M.D.

CONCEPTION THROUGH AN ACCESSORY OSTIUM.

SÄNGER (*The Lancet*, February 16, 1895) reported the following remarkable case where ectopic pregnancy occurred on the right side, and two years later the woman was delivered of the product of a uterine pregnancy by Cesarean section. The products of inflammation around the extra-uterine sac formed a firm resisting

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mass, preventing the descent of the head, although the bony pelvis presented normal measurements. After the section the incision in the uterus was closed, and the parts around it were then carefully examined. The right tube ended in a mass of inflammatory products, which evidently represented the fetal sac. The ostium was lost in old, firm adhesions, and the right ovary could not be found. The mesosalpinx was buried in membranous bands. The left ovary, however, was found, and close to it lay a large, well-fimbriated, accessory ostium. The patient made a good recovery. Sänger maintains that the normal ostia of the tubes were obliterated by the changes caused by ectopic gestation. The patent accessory ostium, however, readily allowed of the passage of ova from the left ovary into the left tube.

Wandering of the Streptococcus from the Mother to the Fetus in the Beginning of Pregnancy.

Chambrelant and Subrazes (*Journal de Médecine de Bordeaux*, 1893) inserted into the ears of a pregnant rabbit a bouillon culture of the streptococcus. Some time after pure cultures of the streptococcus were obtained from the heart, blood, liver, and spleen of the mother and the interior of the embryos. The embryos were the size of lentils and about twelve days old. They were infected with chains of streptococci, as was shown by the examination of sections after hardening in alcohol and staining with picro-carmine.

A Sign of Death by Exhaustion from Insufficient Nourishment of Young Children.

C. Seydel (*Vierteljahrsschrift für gerichtliche Medicin*, 3 F., Band vii, Heft 2) says the narrowing of the stomach and the intestines is, from reference to anatomical variations, not great enough to afford a conclusion of starvation with certainty. Further, there frequently is found in the alimentary tract of such children material which shows that at least shortly before death there has been reception of food. In all cases of death from exhaustion Seydel found a diminution of the thymus gland: frequently its disappearance. If there is at the autopsy no organic disease, and there is found a high grade of emaciation and diminution of the inner thoracic glands, this is, according to Seydel's opinion, a sure sign of exhaustion through insufficient or improper feeding.

Rupture of the Uterus During Labor.

L. M. Bossi, of Genoa (*Nouvelle Archives d'Obstetrique et de Gynécologie*, No. 7, 1893), describes two cases of rupture of the uterus during labor. Both cases occurred in multiparæ with narrow pelves, the fetus presenting in the one case by the shoulder; in the other there was placenta previa, and the rupture took place during version by the feet. The first case, in which the child was already in the pelvic cavity and was operated upon in bed under unfavorable circumstances, terminated favorably; the second case died.

Upon the experience of these cases Bossi concludes that the Porro operation, with dropping of the pedicle into the pelvic cavity after previous ligature with an elastic ligature, offers the best chance to end the operation quickly and safely. He rejects the suture of the uterus, as it requires too much time and in deep jagged tears is often difficult to make.

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Treatment of Apparent Death in the New-Born.

Bernheim (*Nouvelle Archives d'Obstétrique et de Gynécologie*, 1893, Nos. 9 and 10) mentions the much-used methods of Schultze, Marshall-Hall, Sylvester, etc., and refers to the exceptionally good results which have been obtained by the method of Laborde after the failure of the usual methods. It consists simply in the drawing forward of the tongue, which should be carried out with regular intermissions similar to the rhythm of respiration. The action Bernheim refers to reflex irritation which is referred to the respiratory centre through the motions of the base of the tongue.

The Relation between the Head of the Mother and that of the Child, and their Obstetric Importance: with Regard also to the Pelvis of the Mother.

Gönner (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xxviii, Heft 2) has measured the pelvis, the head, and the height of 100 pregnant women, and compared them after labor with the measurements of the child's head and its weight. The results were as follows:

A relation between the head index of the mother and that of the child does not exist. In only 29 per cent. did the head of the child belong in the same category as that of the mother.

In deformities of the pelvis one cannot estimate from the size of the mother's head that of the child's, and thereby prognosticate an easy or a difficult labor.

With increased height of the mother the weight of the child increases.

Regarding the absolute measurement of the child's head, in 28 per cent. large heads were found associated with children having the usual measurements, and these comprised nineteen male and nine female children. Large heads, therefore, belong to children with usual-sized bodies.

In 15 per cent. there was narrow pelvis of unimportant degree, which was to be referred to smallness of the entire skeleton and caused no obstetric hinderance.

The Treatment of Asphyxia Neonatorum.

Rosenthal (*Therapeutische Monatschrift*, November, 1893) recommends the following method on account of its being less tiresome to the operator than the swinging method of Schultze and more gentle towards the child, yet affording in asphyxia as good results without disadvantages. The child is laid upon a table with the neck supported by a roll. The operator seizes the feet so that the thumbs are in contact with the soles, the index-finger with the back of the feet and the ring-finger resting upon the tendon of Achilles; the remaining two fingers are closed. In regular movements the knees, hips, and spine are bent, so that the knees touch the breast. In this manner the abdomen is compressed and expiration follows; by stretching the body out inspiration follows. The larynx is not compressed by this method, as is possible for it to be by the Schultze method. This method may also be employed where fracture of the arm or of the clavicle is present.

Another mode consists in the suspension of the child by the legs. The advantage of this is the discharge of the inspired amniotic liquor and blood from the nose, mouth, trachea, and bronchi. At the same time the operator seeks to favor the removal of the aspirated fluid with the finger, causing attempts at vomiting, which compress the lungs. By this means aspirations pneumonia is safely avoided. The legs should never be held in the naked hand, but with a towel, in order that they may not slip.

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The Curette in Puerperal Infection.

Ferré (*Nouvelles Archives d'Obstétrique et de Gynécologie*, November 25, 1894) strongly advocates the use of the curette in puerperal infection, after a long experience of irrigation of the uterine cavity, a procedure which lowered mortality but did not save several bad cases. At the same time he never had recourse to the curette after labor except when placental remains required removal. Since using the curette six bad cases had been treated by Ferré with only one death. The fatal case, it must be noted, was a private patient, and symptoms of infection immediately followed natural labor at term. She was left without assistance for five days, and the curette was employed as a last resource. The patient died on the seventeenth day. In a second private case the curette was used on the second day immediately after a rise in temperature with rigors. The symptoms of infection at once vanished. In a third, a live child was born; a twin then presented by the shoulder. Embryotomy had to be performed. Fever set in on the same evening; next day large blunt curettes were used, without anesthetic, the uterine cavity was swabbed with glycerin of creosote and plugged with iodoform gauze. All bad symptoms disappeared at once. The three remaining cases were in the Pau Lying-in Hospital, and had all the advantages of treatment in a public institution. They resembled the second above described except that in one case parametritis set in before the curette could be used. All recovered.

The Acute Infective Diseases and Abortion.

Klautsch (*Münchener medicinische Wochenschrift*, December 26, 1894) asserts that pregnancy may here be terminated either by the death of the fetus or, as less frequently happens, by premature uterine contractions. The fetus may die owing to (*a*) deficiency of oxygen; (*b*) alteration in temperature; or (*c*) direct transmission of the infection. These conditions may be combined. The inconstancy of the transmission of the infection Klautsch explains by the circumstance that it can occur only when the normal connection between the maternal and fetal circulation is disturbed. Premature pains may be caused by (*a*) increased bodily temperature; (*b*) altered blood; (*c*) changes in the uterine mucous membrane, as an endometritis exanthematica; or (*d*) toxines present in the blood. If the deficiency in oxygen occurs rapidly, the fetus dies; if more gradually, pains are induced. In typhoid fever abortion occurs in more than half the cases, and the fetus is mostly born dead, usually from the transmitted infection. Cholera is not transmitted to the fetus, the death being here due to the altered blood, to an endometritis, to a diseased fetal placenta, and to temperature variations. In measles the fetus rarely dies. In severe malaria the fetus is more often born alive but soon dies of malarial cachexia. In pneumonia the death of the fetus is not uncommon and is due to asphyxia. Variola frequently kills the fetus, yet many are born alive. As regards the pains, the fetus may be expelled in variola, even during the suppurative stage; in malaria after the paroxysm; in erysipelas most often when the eruption appears; in cholera during the transition stage; in influenza soon after the onset of the febrile symptoms; in pneumonia on the third or fourth day. In typhoid fever the abortion may be accompanied by much hemorrhage or strong contractions and little hemorrhage. In cholera the hemorrhage is profuse and the contractions are violent. The fetus is mostly much more threatened by the altered temperature, disturbed circulation, and pathological changes in the endometrium than by the transmission of the infection.

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The Lower Uterine Segment.

Regnoli, of Rome (*Centralblatt für Gynäkologie*, No. 49, 1894), has investigated this subject upon the bodies of two pregnant women and six who died in the puerperal state. He draws the following conclusions:

The vena coronaria may always be recognized at the end of pregnancy and in the beginning of the puerperium. It is placed sometimes higher and sometimes deeper than the contraction-ring. It indicates always the upper boundary of the lower uterine segment.

In those cases in which the contraction-ring was recognized it did not always correspond to the attachment of the abdominal tissue; it was shown by a thickening and shortening of the muscle-fibres on that position where the lower uterine segment begins to become thinner and is marked on the outer as on the inner wall. The outer wall is always thinner than the inner.

The lower uterine segment may be clearly recognized as a part of the uterine body in pregnancy as well as in the puerperium, and the cervix may be recognized through the arrangement of the muscle-fibres and through the scarcity of the cervical glands.

Normal Pregnancy after Abdominal Hysteropexy.

Fraipont (*Annales de la Société Médico-Chirurgicale de Liège*, 1894) reports four cases where pregnancy and labor were practically normal, though the uterus of each patient had been fixed to the abdominal walls. In two of the cases the hysteropexy had been performed over five years before the pregnancy occurred, and, although the bands of adhesion between the fundus and the parietes must have become very tough after so long a period, no special difficulty was encountered. In two of the cases the forceps was used, but not on account of uterine inertia; the fetal head was voluminous, and in one of the two cases internal rotation was delayed. The placenta was always expelled easily, and no serious postpartum hemorrhage occurred. Fraipont observed the progress of pregnancy in several of these cases. The uterus does not increase specially in its posterior part, but quite uniformly, so that, as might be expected, the fundus gradually detaches itself from the abdominal wall. Even if the adhesions were not broken down they would of necessity be so stretched as to be useless for their original purpose after delivery. Bands of adhesion could not share in the process of involution. As, however, the uterus undergoes perfect involution, it is restored to its original condition before the onset of the disease which rendered hysteropexy necessary.

Pregnancy and Warts on the Vulva.

Porak (*Bulletins et Mémoires de la Société Obstetrique et Gynécologique de Paris*, October, 1894) reported a case demonstrating the necessity of removing during pregnancy warts which develop exuberantly on the vulva. The patient was 22 years old, and a II-para. During the fourth month of her pregnancy she suffered from a free discharge and much dysuria. In the second half of pregnancy warts began to develop, and at delivery they were abundant, covering the outer side of the labia majora and the vulvar orifice. She was delivered of a small male child somewhat before term. Although the delivery was conducted with the most careful antiseptic precautions, and the child's eyes were carefully washed with a 1 : 5000 sublimate solution, the infant was soon attacked with severe purulent ophthalmia. After daily cauterizations with nitrate of silver and frequent bathing with boric

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acid solution the eyes recovered. The lochia remained free for ten days, and continued purulent for a few days longer. The warts were left untouched for exactly two months, iodoform being used, and cocaine ointment being applied, as there was much pain. The vagina was plugged all through this treatment. Since the growths remained unchanged they were removed under chloroform. The end of this clinical history shows the fallacy of the idea that warts disappear spontaneously after pregnancy. The discharge was clearly gonorrheal, as the ophthalmia in the child amply proved.

GYNECOLOGY.

UNDER THE CHARGE OF

CHARLES BINGHAM PENROSE, M.D.,

ASSISTED BY

WILLIAM A. CAREY, M.D., AND H. D. BEYEA, M.D.

Celiotomy in the Treatment of Puerperal Septicemia.

E. P. Davis (*American Journal of Obstetrics*, February, 1895) gives the following summary of a paper on this subject:

When the uterus and vagina have been thoroughly disinfected by curette and douche, and the lymphatics of the pelvis and peritoneum have been well drained by saline purgations, if the patient does not improve the question of celiotomy must be considered. If an infective focus can be distinctly outlined under anesthesia it must be, if possible, extirpated. Vaginal celiotomy will often drain a pelvic abscess with the least disturbance and give valuable time for an improvement in the general condition. If vaginal hysterectomy with removal of tubes and ovaries can be performed it may supplement the vaginal drainage of an abscess. If it cannot be performed suprapubic celiotomy, with amputation or extirpation of the uterus and appendages and vaginal drainage, is indicated. Celiotomy, flushing with saline solution, and drainage are also indicated in beginning infection of the general peritoneal cavity.

The Treatment of Myomata Complicating Pregnancy.

F. B. Jassatt (*British Gynecological Journal*, November, 1894) concludes an interesting paper upon this subject as follows:

(1) In those cases of subperitoneal myoma which are either pedunculated or situated in the body of the uterus, if growing rapidly or of large size, the surgeon would be justified in opening the abdomen and enucleating the growths.

(2) In cases where there are a large number of subperitoneal and interstitial myomata of considerable size studded over the uterus, and these are found to be increasing, the whole organ and tumor should be removed.

(3) In cases of interstitial or submucous fibromyoma complicated with pregnancy, statistics seem to show that the risk to the patient is greater if left to go to the full period than if abortion is produced or the organ removed.

(4) Cases in which the cervix is the seat of the disease may be allowed to go their full term, as the growth, if presenting in the vagina, may be either enucleated or removed *morcellement* at the end of gestation.

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Statistics Relative to Fibromyoma of the Uterus.

The *British Gynecological Journal*, November, 1894, abstracts an article written by Terrillon, from which the following conclusions were drawn:

During the past thirteen years Terrillon examined and kept himself informed about the condition of 235 cases of this disease.

Of this number 122 cases were subjected to operation. Eighty abdominal hysterectomies were done, forty-five having the pedicle treated intraperitoneally and thirty-five extraperitoneally. Thirty cases had the ovaries removed, with no death. There were twelve vaginal hysterectomies with two deaths.

In none of the cases in which the ovaries were removed was there any diminution of the size of the tumor. Of the cases not subjected to operation the writer considers the best treatment to be rest in bed with an abdominal binder in position. While a few cases were benefited symptomatically by the use of electricity, he never observed any diminution in the bulk of the tumor in ninety cases which he examined with special reference to this question. He believes that neither electricity, mineral waters, nor the menopause ever has any effect in lessening their growth, but that they may grow up to or beyond 60 years of age.

The Pneumococcus in the Pus of an Ovarian Abscess.

Von Rosthorn (*Prager medicinische Wochenschrift*, No. 2, 1894) reports a case where he found the pneumococcus in the pus of an ovarian abscess, and writes that he has been able to find only two cases reported in the German literature (Sweifel and Frommel), and one case in the French literature (Morax), where this organism was found in the pus of a pyosalpinx. The first case (Sweifel) was in a girl, 18 years of age, who had had neither pneumonia nor tuberculosis. She recovered after operation. The second case (Frommel) occurred in a woman 38 years of age, who was suffering with phthisis pulmonalis. The pyosalpinx appeared after a puerperium associated with fever. The patient died with sepsis, and at the post-mortem, made sixty hours after death, Fränkel himself procured an almost pure culture of the organism. Inoculations from this culture into animals proved rapidly fatal. This case proved that the pneumococcus is excessively virulent. The history of the writer's case is as follows: A servant girl, 28 years of age, had complained of pain in the lower abdomen, since a puerperium associated with fever six years before. On making a vaginal examination a very painful and immovable tumor, the size of an orange, was felt in the right ovarian region. After many weeks of conservative treatment and rest without the least benefit, the tumor was removed by abdominal incision. At the operation the growth was found so universally covered with adhesions that its anatomical parts could not be recognized. The complete separation of the growth from the lateral wall of the uterus and pelvis was impossible, and it was therefore amputated with the thermo-cautery. The site of the growth was packed with iodoform gauze, and the stump sutured to the abdominal wall. The tumor was the shape of an egg, twelve centimetres in length, and on section was found to be an abscess containing a thick greenish pus. The walls were composed of very dense tissue, and its internal surface was covered with a membrane, which at first sight appeared like mucous membrane, but was truly an abscess membrane. Microscopical sections showed the abscess wall to contain the tube wall, ovarian tissue masses of caseation. An inoculation taken from the pus gave a pure culture of the pneumococcus. The patient recovered.

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Placenta Previa.

Cumston (*Annals of Gynecology*, September, 1894) gives the following directions for preparing the tampons used in the treatment of placenta previa.

Sterilize good absorbent cotton by placing in a sterilizer and boiling for ten minutes, draining in a sterilized, perforated steel box for twenty-four hours. Having sterilized the hands, make the cotton into tampons, and place about forty into a medium-sized sterilized glass jar. Pour into the jar the following solution:

Iodol	10.0
Alcoholis absolut., q. s. ad perfect sol.	
Glycerin pur.	200.0

Before introducing the tampons into the vagina, cover them with a thin layer of 3 per cent. carbolized vaseline, which forms a sort of cement not penetrated by blood. Insert fifteen or twenty of these tampons, about the size of a walnut, into the vagina, in such a way that the cavity is transversely dilated and reaches the walls of the pelvis.

Gestation complicated by Appendical Abscess.

McArthur (*American Journal of Obstetrics*, February, 1895) reports two cases of pregnancy complicated by abscess of the vermiform appendix. One case was advanced to four and a half and the other case to five months. Both cases were operated upon and the abscess cavity drained before general peritonitis had occurred.

Abortion resulted in the first case the morning following operation, and in the other case not for two days later. The lessons of the cases detailed may be set forth in the following propositions:

(1) That the largest proportion of all cases of acute suppurative appendicitis are seen by the surgeon only forty-eight hours or more after their onset.

(2) That in the great majority of such cases an abscess exists outside of the appendix and whose walls are made up of the structures which surround the appendix at the onset of inflammation, and which are held together by plastic lymph.

(3) That profound sepsis, either chemical or bacteriological, will sooner or later induce fetal death and miscarriage.

(4) That after the third month of gestation a portion of the wall of the appendical abscess is usually formed by part of the right wall of the uterus.

From the fact that after opening the abscess and draining its cavity there is a shrinking of its wall and a disturbance of the relationship of parts which existed prior to operation, with the risk of infection from such cause, and as it seems most likely, for reasons mentioned, that the fetus cannot be saved, it seems good practice to lend every effort to save the mother, and to, therefore, before closing the abdominal wound, empty the uterus and establish those relations of the structures which we desire to maintain after closure of the abdomen.

Removal of the Appendages and Ligation of the Uterine Artery at the Utero-Cervical Junction.

Byron Robinson (*The Journal*, February 16, 1895) reports thirty cases of this operation with two deaths, one from suppression of urine on the sixth day and one apparently from shock.

The technique of the operation consists in ligating and removing the appendages and then passing an aneurism needle armed with a double ligature through

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the broad ligament at the cervico-uterine junction on the inner side of the uterine artery.

One of these ligatures is tied along the side of the uterus including the perpendicular arteries of the uterus, the Fallopian tube, round and ovarian ligaments. The other ligature is tied on the broad ligament, including the ligamentum infundibulo-pelvicum.

The author prefers this method to the simple ligation of the uterine artery once or twice as it courses through the broad ligament, as the first method atrophies not only blood-vessels but nerves and ganglia.

In nearly all the cases operated upon the uterine artery has been ligatured down to the cervico-uterine junction. No indications have yet appeared of tissue death in the uterus. In some cases pain is severe for about fifteen hours, but it has been allayed by one-sixteenth-grain doses of morphia given once or twice during this period. The operation is presented as one having wide application in gynecology. It produces sufficient shock on the circulatory and nerve apparatus to quickly atrophy growing uterine myomata. The effect of ligating the uterine arteries as they course through the broad ligament is to atrophy the endometrium rapidly,—checking endometrial secretions and hemorrhages. The pelvic floor is preserved intact by this operation, obviating the danger of vaginal hernia. This operation brings on the menopause early, it followed in two months in one case. The operation leaves a functionless, atrophic, normal-positioned uterus, which so far as has been observed in this series of cases, dating back two years, has caused no trouble. The utility of the operation consists in the following points:

It checks hemorrhage. It arrests menstruation. It elevates the uterus. It shrinks the uterus. It avoids the removal of uterine myoma. It avoids vaginal hernia.

The author claims that he has proved many times, by subsequent examinations, that this operation will cause a shrinking and atrophying of large, hard, metritic uteri. It also elevates a retroverted uterus and maintains it in position. It is superior to hysteropexy, as it leaves a movable uterus.

Two objections might be raised against the operation,—the danger of gangrene and the ligation of so much tissue,—but so far as is known no trouble has come from such conditions. Care must be exercised in regard to penetrating the bladder and including a ureter in the ligature. It is suggested that the ligature which includes the broad ligament should not embrace the Fallopian tube with its mucous membrane, as that might enhance the chances for suppuration. The needle could be passed just beneath the tube, and this method would not protract the operation many minutes.

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PATHOLOGY.

UNDER THE CHARGE OF

JOHN GUITÉRAS, M.D.,

ASSISTED BY

JOSEPH McFARLAND, M.D.

A Case of Tuberculosis in a Lion.

Strauss (*Archives de Médecine expérimentale et d'Anatomie pathologique*, Tome vi, 1894, p. 645) had the opportunity to make a post-mortem examination upon a 5-year-old lion, which had been four years in captivity and had emaciated almost to a skeleton. A sister lion which had been kept under the same conditions died with similar symptoms. The autopsy showed a fibroid phthisis of both lungs, with numerous small vomicæ in whose contents tubercle bacilli were found.

The Action of High Pressure on Microbes.

Roger (*Semaine Médical*, December 5, 1894) reports the results of the first experiments made to determine the effects of high liquid pressure applied to growing bacteria. The streptococcus of erysipelas and bacillus coli communis and anthrax bacilli were found in the first series of experiments to withstand 1000-3000 kilos successfully. A second series showed that non-sporiferous anthrax bacilli are killed in large numbers by a pressure of 2000 but especially 3000 kilos (967-2900 atmospheres), and that those which continue to live are diminished in virulence.

The Supposed Antagonism between the Cholera Spirillum and the Bacterium Coli Commune.

Kemperer (*Centralblatt für Bakteriologie und Parasitenkunde*, January 10, 1895, Band xvii, No. 1), after a series of careful experiments with mixed cultures and egg-inoculations, shows that the absence of the bacterium coli commune from the stools of cholera patients, which some have thought due to some contra effect of the products of the cholera organism upon the colon bacillus, is not due to an antagonistic action of the cholera spirillum, but is due to the fact that the profusion of the stools and the rapid development of the spirillum in the intestine cause the colon bacilli to be outgrown.

Tuberculosis of the Human Placenta and its Relation to Congenital Infection with Tuberculosis.

Schmool and Kockel (*Beiträge zur pathologische Anatomie und allgemeine Path logie*, Band xvi, p. 313-339) describe three cases of placental tuberculosis. Two of the women suffered from general miliary tuberculosis, the other from a chronic pulmonary and laryngeal tuberculosis. All the women died. In only one case was the fetus diseased. It was seven or eight months old, and exhibited in the capillaries and vessel walls, as well as in the hepatic lymphatics, tubercle bacilli.

In the placenta from the chronic case slight tuberculous changes were observed. In all three placentas the changes were slight.

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Placental Tuberculosis in Cows and Fetal Tuberculosis.

Kockel and Lungwitz (*Beiträge zur pathologische Anatomie*, Vol. xvi, Heft 2) report the examinations of two bovine feti, one six, one four and a half months old, both taken from the bodies of cows with distinct tuberculous lesions. Both feti showed microscopical as well as macroscopic tuberculous lesions of the liver, portal and bronchial lymph-glands, etc. In both cases there was extensive tuberculosis of the uterine mucous membrane, and in the first case tubercle bacilli were found, though in small numbers, in the chorionic villi. In the second case no bacilli could be found in the tissues of the chorion, though a considerable number were seen in the epithelium and also between the epithelium and membrane of the chorion. The writers think these cases confirm the view of Birch-Hirschfeld that the tubercle bacilli enter the fetus by growing through the placenta.

The Treatment of Inoperable Malignant Tumors with the Toxines of Erysipelas and Bacillus Prodigiosus.

Coley (*Medical Record*, January 19, 1895, Vol. xlvii, No. 3) gives the following comprehensive method of preparing the toxines for injection:

To make the toxines of erysipelas and prodigiosus, ordinary peptonized bouillon is put into small flasks containing 50 to 100 cubic centimetres, which after proper sterilization are inoculated with the streptococci of erysipelas and allowed to grow for three weeks at a temperature of 30°-35° C. The flasks are then inoculated with bacillus prodigiosus, and the cultures allowed to grow for another ten or twelve days at room temperature. At the end of that time, after being well shaken up, the cultures are poured into sterilized, glass-stoppered, one-half-ounce bottles, and heated to a temperature of 50°-60° C. for an hour, sufficiently to render them perfectly sterile. After cooling, a little powdered thymol is added as a preservative, and the toxines are ready for use. The toxines when prepared in this way are very much stronger than when filtered through a Pasteur, Chamberland, or Kitesato filter. . . . If, as is sometimes the case, the preparation is found to be too strong for use with safety, it can be diluted with glycerin or sterilized water.

The method for preparing the bouillon in which the bacteria are grown is identical with that in ordinary use, except that it is always made from meat and is not neutralized, the acid reaction normal to the meat bouillon being better for the growth of the erysipelas coccus.

In order to keep up the virulence of the cultures, they are put through rabbits in the following way: The hair of the ear is clipped close with a pair of scissors, and the skin washed with a weak carbolic acid and then sterilized water. A minute quantity of a bouillon culture, forty-eight hours old, is then injected subcutaneously in four or five different places in the ear. Forty-eight hours later, after again washing the ear with carbolic acid and sterilized water, a flat needle, sterilized in the flame, is inserted under the skin at or near a point of inoculation, and the layer of the skin cut off with a sharp sterilized scalpel. The piece of skin is then rubbed well over the surface of an agar-tube with a thick platinum wire needle. After twenty-four hours in the incubator the colonies of streptococci will show as minute white specks, and from them a pure culture can be obtained. If the agar is made with 75 per cent. of bouillon and 25 per cent. of urine, the streptococci will grow more freely than if bouillon alone is used.

The dose varies from one to eight minims, and causes a distinct febrile reaction.

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The Permanence of Cholera Spirilli in Feces.

Abal and Claussen (*Centralblatt für Bakteriologie und Parasitenkunde*, January 31, 1895, Vol. xvii, No. 4, p. 118) report an elaborate investigation upon this subject, and conclude:

(1) The cholera spirilli are, as a rule, destroyed in feces in from twenty to thirty days.

(2) In many stools no spirilli can be demonstrated after the first three days.

(3) The peptone-solution method of determining their presence seems to be about the best.

The Persistence of the Bacillus of Lœffler after Recovery from Diphtheria.

Schäfer (*British Medical Journal*, January 12, 1895, p. 61) reports several cases of diphtheria which recovered after the antitoxin treatment, in the throats of which virulent diphtheria bacilli remained for an unusually long time. A sample taken from the throat of one of the boys showed bacilli in the degeneration stage as long as five weeks afterwards, which was thought remarkable; but a sample taken from the throat of another was found to contain virulent bacilli *seven months and a half* after the attack.

Parke and Beebe found live virulent bacilli five weeks after convalescence.

Washbaum and Hapwood (*British Medical Journal*, January 19, 1895, p. 121) found them sixty-three days after the disappearance of the membrane.

DERMATOLOGY.

UNDER THE CHARGE OF

LOUIS A. DUHRING, M.D.,

ASSISTED BY

M. B. HARTZELL, M.D.

Gallanol in Psoriasis.

Joseph, of Berlin (*Monatsheft für Praktische Dermatologie*, Band xx, No. 1, p. 35) regards chrysarobin as occupying the first place in the local treatment of this disease, but, unfortunately, it often produces severe inflammation, and discolors the skin, hair, and clothing. Cazeneuve and Rollet, about two years ago, first called attention to the value of gallanol. This drug, which is gallic-acid-anilide, exists as colorless crystals, with a slightly bitter taste, and is soluble in hot water, ether, and alcohol, and insoluble in benzine and chloroform.

It acts less rapidly than chrysarobin. It is especially to be recommended in mild psoriasis, particularly of the face and scalp, on account of its not discoloring the skin and hair. It may be used with liquor gutta-perchæ or as an ointment, in 10 per cent. strength, which never produces inflammatory reaction. In eczema the drug does not prove of special value, but it is useful in tinea circinata and in eczema marginatum, and in the latter affection especially, in that it does not discolor the underclothing.

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J. CHRISTIAN BAY, of Iowa (*Journal of American Medical Association*, January, 1895, p. 31) concludes from a series of investigations concerning the specific organisms of vaccinia and variola that the organisms in the spore stage found by him, and named "dispora variolæ," are identical with the organisms described by others as "micrococcus vaccinæ," "micrococcus variolæ," "microspheria vaccinæ," and the like. The dispora variolæ was found with three exceptions in sixty-five cultures from vaccine points and in forty cultures from the lymph of confluent small-pox. He believes that these spores are the main source through which variola as well as vaccinia is reproduced.

HISTOLOGICAL STUDY OF MYCOSIS FUNGOIDES.

E. LEREDDE (*Annales de Dermatologie et de Syphiligraphie*, Vol. v, No. 5, May, 1894) finds that histologically the disease bears no relation to any of the well-known pathological processes. It may be recognized by the following microscopical characters: proliferation of connective-tissue cells about the vessels, presence of "mash" cells, the formation of perivascular masses made up of a network containing connective tissue cells and lymphocytes, invading the subpapillary layer and later the papillæ; peculiar giant-cells, together with vascular changes and endothelial proliferation.

ADENOMO-CARCINOMA OF THE SKIN ORIGINATING IN THE COIL-GLANDS.

J. A. FORDYCE (*Journal of Cutaneous and Genito-Urinary Diseases*, February, 1895) describes an instance of this rare form of disease, and enters in particular upon the anatomy of the structure. Certain sections of excised portions of the growth represented in a striking manner the adenoma-like structure of the new growth, together with the intra-canalicular proliferation of the basement cells. The cavities were lined by a double row of cubical cells, which were united in places by connecting bands, thus dividing the tubes into cavities. There was no tendency to cell-nesting. Other parts of the skin were not invaded by the cancerous process.

ADEPS LANÆ IN PRACTICE.

UNNA (*Monatsheft für Praktische Dermatologie*, January, 1895, Band xx, No. 1) gives his experience in experimenting with lanolin and adeps lanæ, covering a period of two years. Reference is made to the fact that the adeps lanæ of to-day is a much more desirable product than that made a year or two ago. The authors favor adeps lanæ rather than lanolin, not only because it is cheaper but because of its intrinsic superiority. The following formula for a good cold-cream ointment is given:

℞	Adeps lanæ,	10.0;
	Olei amygdalarum,	10.0;
	Aq. naphæ,	20.0.

He concludes that adeps lanæ may take the place of lanolin with advantage in all fatty ointments and cooling salves. It is also useful in the preparation of "salve-sticks," pastes, and salves for mucous membranes, and especially in the manufacture of plasters. For hospitals and dispensaries, on account of its comparative cheapness, it is in particular worthy of recommendation. Free chlorine, which some observers claim to have found in adeps lanæ, Unna, Mielck, and Troplowitz state does not exist in this substance.

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Early Bacteriological Diagnosis of Lepra.

Marcano and Wurtz (*Archives de Médecine Expérimentale et d'Anatomie pathologique*, January, 1895) conclude from their studies that lepra often first appears in the form of an isolated "spot," or macule, having no specific characteristics, except anesthesia on its surface and around it. The proof of the presence of the bacillus of lepra in these insidious cases is of therapeutic importance. The lesion, where the disease is suspected, should be excised, care being taken to include tissue beyond the anesthetic zone. In a case examined by the writers nothing was found in the blood. The bacilli should be sought for in the derma, the entire thickness of which should be excised and examined.

Epithelioma of the Skin of the Face.

From the point of view of treatment Lagoutte (*Lyon Médical*, No. 51, 1894) distinguishes two forms: (*a*) superficial epitheliomata; (*b*) deep epitheliomata. The first are curable by the most diverse medication (chlorate of potassa, resorcine, aniline dyes, etc.). The numerous observations published of such cures justifies the employment of these remedies in the beginning of the treatment. If the lesion persists, recourse should be had to destructive methods. Caustics should, according to the author, be absolutely rejected, and the sharp curette, or, preferably, the knife, be used. As to the deep and grave forms, only free ablation accompanied by extirpation of the ganglia is justifiable. In cases in which the limits of the disease cannot be passed considerably, the treatment should be limited to palliation.

Three Cases of Pemphigus Vegetans.

H. Koebner (*Deutsches Archiv für klinische Médicin*, Band LIII) gives the notes in full of three cases of this rare and malignant variety of pemphigus, first directing attention to the several diseases from which it is to be distinguished; these are aphtha of the mouth and vagina, herpes of the genitalia, herpes iris, dermatitis herpetiformis, impetigo herpetiformis, and especially syphilis of the skin and mucous membrane. It is usually mistaken for syphilis. It has been carefully described and figured by I. Neumann, of Vienna, Crocker, of London, and Hyde, of Chicago. In the differential diagnosis Koebner dwells especially on the resemblance of some of the lesions to confluent syphilitic mucous patches ("condylomata lata"). Two of the cases ended fatally, the usual course of this variety of the disease. A photograph and a chromolithograph illustrate the paper, which is a valuable contribution to the subject.

The Etiology of Eczema.

In the Dermatological Section of the Congress of Russian Physicians, 1894, Abramitcheff (*Journal des Maladies Cutanées et Syphilitiques*, November, 1894) reported the following cases of eczema:

(1) A woman, aged 30 years, who had had an eczema for thirteen years, which did not yield to treatment, was found to have a movable kidney. The patient was provided with a belt, and the eczema disappeared. If the belt was left off for some days the eruption reappeared.

(2) A patient affected with an eczema for six years was cured after the expulsion of a tape-worm.

In two other cases the eczema was due to strong emotion.

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A Case of Foot and Mouth Disease in Man.

Scheyer (*Dermatologische Zeitschrift*, Band II, Heft 1) reports an instance of the transferrence of this disease to man. After briefly reviewing the literature of the subject, the author reports the following case: A laborer, 43 years old, was employed in taking care of cattle affected with foot and mouth disease. Two weeks before coming under observation he was compelled to give up his work, having moderate fever, angina, headache, and constipation. About the same time an eruption appeared upon the upper lip and the hands. This eruption appeared as vesicles filled with a sero-purulent fluid. At the time of observation these had disappeared, being replaced by pale-violet nodules, some of which were slightly scaly, others exuded a small quantity of serum from small erosions on their summits. These lesions were not painful nor sensitive to pressure. Lymphangitis and swelling of the axillary glands accompanied the eruption. Upon the upper lip was a hard lesion covered with a bloody crust. This was, like the others, painless. In most of the lesions healing took place with the formation of smooth scars; but in a few instances wart-like growths formed, under which healing occurred later.

The Plurality of Favus.

In an etiological, clinical, and mycological study of favus (*Annales de Dermatologie et de Syphiligraphie*, No. 11, 1894), pursued in the laboratory of M. Besnier, Bodin arrives at the following conclusions:

Among the etiological factors, contagion, mediate or immediate, through one affected with favus, occupies the first place. Transmission from animals occurs, but much less frequently. The saprophytic existence of the achorion is possible, and man may meet with it free in nature.

From the clinical point of view one may properly distinguish divers forms of favus (impetiginous, atypical favus, etc.). Nevertheless, a careful examination of the elementary lesions shows that the disease is always the same, the differences which separate the clinical forms being due to accessory characters. Neither the unity nor the plurality of favus can be proved by the microscope in the present condition of our knowledge.

The study of cultures of the achorion demonstrates the following facts:

(1) The culture medium plays a most important *rôle;* and unless one recognizes this importance, the results which one obtains lack experimental exactness.

(2) In the cultures of the achorion, as in those of the trichophyton with large spores, cryptogams are found, and that in four-fifths of the cases. The associated fungi do not play any pathogenic *rôle*.

Undeniable varieties of the achorion exist. They are not numerous, and are closely related, but they seem absolutely distinct from one another. In fifty cases of favus the author found five varieties of fungus, as follows:

(1) The achorion Schonleinii, as described by Kral.

(2 and 3) Two undescribed varieties.

(4) The achorion enthytrix of Unna.

(5) The achorion atakton of Unna.

The true form of fructification of the achorion being as yet unknown, its place in the classification of the fungi remains yet to be fixed.

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The Treatment of Rhinoscleroma.

Stoukovenkoff (*Journal de Maladies Cutanées et Syphilitiques*, November, 1894) reports a case of rhinoscleroma treated with injections of Fowler's solution. The patient was 21 years old, and the disease had lasted three years. The strength of the injections was gradually increased from 1 per cent. up to 12 per cent. At first one gramme was injected, but at the ninth injection the quantity was increased to four grammes. The injections were made daily, at first superficially, then more deeply. After the eighth injection improvement began; after the twenty-third, atrophy; and after the forty-fifth the nodules disappeared. In the course of fifteen months 222 injections were made. Six months later the patient's health was perfect.

MISCELLANEOUS.

THE QUESTION OF PRIORITY IN CASTRATION FOR PROSTATIC HYPERTROPHY.

It is not two years since J. William White communicated to the American Surgical Association the results of his experiments for inducing atrophy of the prostate in dogs by removing their testicles, and pointed to the marked and speedy diminution of the prostate thus uniformly induced as suggesting the probability that in the hypertrophied prostates of men an equally marked shrinking would follow the same procedure.

Search in literature had enabled him to marshal in addition a very limited number of observations in comparative anatomy, recorded by Hunter, Owen, and Griffiths, that lent additional weight to his own investigations. To these could be added certain observations upon the atrophied condition of the prostate in eunuchs and in one case where the growth of the external genitals had been arrested in boyhood. This was the sum total of recorded knowledge of the influence exerted upon the prostate gland by the testicles that at the time of the publication of White's memoir was in the possession of the medical profession.

The effects of the removal of the ovaries upon the uterus and upon uterine myofibromata were well known generally, and it is doubtless the fact that the similarity in structure between these uterine growths and the prostatic growths awakened in the mind of White the idea that it might be possible to affect the latter through the testicles as favorably as the former were affected through the ovaries that prompted him to his experiments. The final suggestion of the therapeutic application of castration for the relief of prostatic hypertrophy, with which his memoir was concluded, was, evidently, not a haphazard idea, but was

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a logical deduction from an adequate and well-considered series of already established facts. The novelty of the proposition made its proposer show proper caution in recommending it to the attention of the profession, even after he had worked it out, and he forestalled unfavorable criticism by stating that he himself had not then formed definite and final convictions on the subject, but advanced the suggestion for the purpose of provoking discussion and trial.

It is quite evident that the Philadelphia surgeon, previous to the inauguration of his personal experiments early in 1893, had knowledge only of facts that were the common property of surgeons generally. Possibly the existence of a relation between the testicles and the prostate gland, similar to that known to exist between the ovaries and the uterus, had independently occurred to the minds of some surgeons before the publication of White's memoir. Mansell-Moullin has since stated, in his little book on "Enlargement of the Prostate," that in November, 1892, he had discussed with a patient the advisability of trying such an operation, but that the patient declined to have the experiment made upon himself. Even this date was six months after the beginning of White's investigation of the subject, and at any rate Mr. Moullin seems to have himself considered the proposition as a passing caprice, and to have dismissed it from serious consideration, for, notwithstanding the large number of cases of prostatic overgrowth that are continually demanding surgical relief for the most urgent suffering, he does not claim to have considered the subject again until after the publication of White's memoir, nearly a year later, since which time he has unreservedly advocated the operation.

Perhaps no surgeon ever received a greater compliment from another than Mr. Moullin has given Dr. White in the opening sentence of the chapter (XI) in the book referred to, p. 154, which is as follows:

"Removal of the testes is followed in a large proportion of cases, if not in all, by complete and rapid absorption of the enlarged prostate. This has now been proved conclusively. The gland entirely disappears; nothing is left but a little fibrous mass."

It is true that in the later paragraphs of this chapter the author does not specifically state that White had first demonstrated this fact by an elaborate series of experiments upon the lower animals undertaken for the express purpose of determining whether or not such an influence could be exerted upon the prostate by removal of the testicles, and whether, if so, it was sufficiently certain to justify the adoption of the procedure as a therapeutic resource in the prostatic overgrowths of men. It is to be presumed that Mr. Moullin did not think it necessary to restate in so many words what he knew that all the surgical world already knew. An implied compliment is always greater than a badly-

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stated one, and, although it would have been a much more graceful thing for the London surgeon to have fully and specifically stated the real character of the work that had been done by his Philadelphia colleague, it was not necessary, for its omission could not detract from the well-earned credit which is universally ascribed to the latter for his masterly work. An undue sensitiveness has been displayed by some of the American medical journals as to the way in which Mr. Moullin has chosen to speak of White's work, as if in some way the credit of the latter had been assailed, and an important question as to priority had been raised. There is certainly no ground for any of this feeling.

As to actual priority of performance, three months after the publication of Dr. White's memoir a Norwegian surgeon, Ramm, of Christiania, published (September, 1893) the statement that in April of that year, before the reading of White's paper, he had removed the testicles from an old man as an experiment for the purpose of producing atrophy of an enlarged prostate.

In some English and American journals there has been of late quite a number of communications upon various phases of this subject. Not the least interesting is the statement by Harrison, of London, that years ago a patient had requested of him that he would remove his testicles in the hope that it might benefit his prostatic disease! This the surgeon refused to do, and contented himself with subcutaneously dividing the vasa deferentia of his patient, and then "thought nothing further of it" until the fact was recalled by reading White's paper. Here, as far as information goes up to date, would seem to be the real father of the operation. For this man not only conceived the idea, but offered his own body for the performance of the experiment. It is to be regretted that Mr. Harrison did not take advantage of the offer, for, with the light of after events, it is quite apparent that he missed a great opportunity.

These questions of priority of mental conception, of suggestion, or even of actual performance are of little importance. As far as the surgical world is concerned, the fact is undeniable that the general serious consideration of the possible value of the removal of the testicles as a therapeutic measure in the treatment of prostatic hypertrophy dates from June 1, 1893, when J. William White read his paper upon "The Present Position of the Surgery of the Hypertrophied Prostate" before the American Surgical Association. Without this work of White, the subsequently-published cases of Ramm would have attracted but little attention; the operations of Haynes and of many other surgeons which have since been reported would not have been made, and Chapter XI of Mansell-Moullin's book on "Enlargement of the Prostate" would never have been written. (L. S. PILCHER, in the *Annals of Surgery*, March, 1895.)

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AMERICAN MEDICAL PUBLISHERS' ASSOCIATION.

THE Annual Meeting of the American Medical Publishers' Association will be held in Baltimore on May 6, convening in the parlors of the Eutaw House at 9.30 A.M. An interesting programme is being prepared.

CHARLES WOOD FASSETT, *Secretary.*

SIXTH AND CHARLES STREETS, ST. JOSEPH, MO.

BOOK NOTICES.

THE PRINCIPLES OF SURGERY AND SURGICAL PATHOLOGY. General Rules Governing Operations and the Application of Dressings. By DR. HERMANN TILLMANNS, Professor in the University of Leipzig. Translated from the third German edition by JOHN ROGERS, M.D., New York, and BENJAMIN TILTON, M.D., New York. Edited by LEWIS A. STIMSON, M.D., Professor of Surgery in the University of the City of New York. New York: D. Appleton & Co., 1894.

It is now recognized that for the proper appreciation of surgical diseases and their successful treatment a thorough knowledge of surgical pathology is essential. The plan of the present work is an innovation in surgical text-books in this country, and is, we think, a distinct advance. Doubtless, future works will be made to conform to this method of presentation, which is now common in Germany and to a less extent in France.

The first section of this work deals with the general principles governing surgical operations. Under this heading are included the preparation for an aseptic operation, anesthesia, the prevention of loss of blood during an operation, general rules for performing an aseptic operation and for the after treatment of the patient, the different ways of dividing the tissues, the methods of arresting hemorrhage, drainage of wounds, the method of uniting the tissues, general considerations concerning amputations, disarticulations and resections, and plastic operations.

The details for carrying out an aseptic operation are given with a minuteness that leaves nothing to be desired. The splendid achievements of modern surgery have been made possible by the demonstration of the circulation of the blood, the discovery of the anesthetic properties of ether and chloroform, and, lastly, the perfection of aseptic methods.

The second section deals with the methods of applying surgical dressings, and is one of the most valuable in the book, not only on account of its completeness, but because it is a subject that rarely receives proper attention in systematic works. The section includes general principles governing antiseptic or aseptic dressings, the most common

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antiseptic and aseptic dressings for wounds, the preparation of the different dressings, the conditions that call for a change of dressings, and the rules for performing the same, general rules for the application of bandages, the sick-bed of the patient, immobilization appliances and dressings.

The third section opens with a chapter on inflammation. The subject is treated according to the most recent views thereon. A long step forward is taken by the author in the statement, "Of the various inflammatory irritants or causes of inflammation, micro-organisms and the products of their metabolism should be looked upon as the most important." This fact has not been accepted by surgeons as generally as its importance demands. Throughout the work due prominence is given to the influence of micro-organisms, and the practical lessons to be drawn from a knowledge of their power for harm are many. For example, "From a prophylactic stand-point it is best to treat every injury, no matter how trifling it may be, on antiseptic principles."

Syphilis, the author says, "according to recent investigations, is most probably caused, like tuberculosis, by a characteristic fungus." Upon this ground he advocates extirpation of the primary lesion; in fact, he treats every suspicious ulcer in the same way, even when its syphilitic character has not been rendered certain. This view, although not commonly accepted, is probably correct, and corresponds with what is known of the origin of constitutional disease from a primary focus of infection. Tillmanns also advocates the removal of infected glands in suitable cases, in addition to the excision of the primary lesion, as recommended by Bäumler.

Chapter II of this section takes up injuries and surgical diseases of the soft parts; Chapter III discusses injuries and surgical diseases of bone; and Chapter IV the same conditions affecting joints. Chapter V is occupied by a brief review of the subject of tumors.

Tillmanns's reputation as a surgeon and the intrinsic value of his book commend it to all interested in this branch of medicine. The translators deserve especial credit for the manner in which they have performed their task. The paper, press-work, and binding are of the highest order. Illustrations have been freely enployed throughout the work.

FLINT'S PRACTICE OF MEDICINE. A Treatise on the Principles and Practice of Medicine. Designed for the use of Students and Practitioners of Medicine. By AUSTIN FLINT, M.D., LL.D., Professor of the Principles and Practice of Medicine and of Clinical Medicine in Bellevue Hospital Medical College, New York. New (7th) edition, thoroughly revised by FREDERICK P. HENRY, M.D., Professor of the Principles and Practice of Medicine in the Woman's Medical College of Pennsylvania, Philadelphia. In one very handsome octavo volume of 1143 pages, with illustrations. Philadelphia: Lea Brothers & Co., 1894.

The first issue of this now classic work appeared in 1866, after its author had enjoyed an experience of some thirty years as a teacher and

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physician. Dr. Henry has succeeded in bringing this last edition fully abreast with the times. The work has not suffered at the editor's hands, but is fully up to the best. All or most of its distinguished author's inimitable descriptions of the course and symptoms of disease are retained. Only where recent investigations have thrown light upon the etiology and treatment are changes made. However, the section on dyspepsia is entirely replaced by one written by Professor Henry. In this section exception may, perhaps, be taken to such expressions as "peristaltic unrest" and "incontinence of the pylorus," as introducing new and rather confusing terms without any definite results. In late years clinicians have universally come to consider peritonitis, at least in the vast majority of cases, as a symptom of a local disease rather than an idiopathic disease. The editor has allowed the author's views of this condition to remain, possibly to the detriment of the work. The same may be said of the retention of the chapter on typho-malarial fever. His note—"The only positive criterion of the nature of the false membrane (diphtheritic)—and hence of the disease—is afforded by a bacteriological examination of the exudate"—is undoubtedly correct, but its force is lost by being placed as a small foot-note instead of heading the section on the diagnosis of diphtheria. It is manifestly a most difficult task to edit a work of such reputation and worth without impressing too glaringly the editor's personality. Dr. Henry has performed this task excellently, and should receive the thanks of all physicians for retaining the great work among the current literature.

A MANUAL OF MODERN SURGERY, GENERAL AND OPERATIVE. By JOHN CHALMERS DA COSTA, M.D., Demonstrator of Surgery in the Jefferson Medical College, etc. Philadelphia: W. B. Saunders, 1894.

This is one of Saunders's "New Aid Series," and is intended "to stand between the complete but cumbrous text books, and the incomplete but concentrated compend." In its preparation the author has culled from a great mass of surgical literature, as the frequent quotations and references in the text attest.

A vast amount of information has been condensed within the limits of the present work. The task of epitomization is a difficult one, as there is always the danger that, in the desire to abbreviate, the fundamental principles of a subject will either be lost sight of or be imperfectly presented. These the author has in most instances avoided.

A chapter is devoted to the discussion of bacteriology, which is now considered an essential preliminary to a surgical training. Among other bacteria of surgical interest mentioned is the "gonococcus or Neisser's bacillus." The latter term seems inappropriate, as this germ is a typical coccus. It is stated that the bacterium coli communis is the supposed cause of peritonitis. The author might have added caries and necrosis, metastatic abscesses, etc., occurring in the course of typhoid fever, as well as some other suppurative processes.

A work intended for the use of "the student and busy practitioner" should be specific in its teachings. In this particular we think Dr.

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Da Costa has occasionally erred. We note, for example, in speaking of the treatment of traumatic spreading gangrene, that "stimulants must literally be poured into the patient." Again, among other measures to be employed in treating the paroxysm of hydrophobia, it is recommended to "saturate [the patient] with morphia." Such advice would be properly interpreted by the surgeon, and, perhaps, by some students, but we believe that, if the doses were specifically given in each instance, the purpose of the work would be more fully accomplished.

After describing the symptoms of the *first stage* of hip-joint disease, the author says, "The diagnosis in this stage is more or less problematical." We are inclined to take issue with the writer on this statement. We think the diagnosis of this disease should almost invariably be made in the first stage, and the proper treatment instituted at once, as it is at this time that our efforts are followed by the best results. Note the symptoms of the *second stage:* The child limps; the adductor muscles are rigid; the hip is broadened by an effusion in the joint; the thigh muscles are atrophied; the extremity is pushed forward, abducted, and everted; the fluid effusion may be absorbed, or may find its way externally by means of sinuses; the bones are worn away and destroyed," etc., "and the third stage is established," all of which should have been prevented by diagnosis and treatment in the first stage.

We note some lack of care in reading the proof. Ashhurst is misspelled "Ashurst," five times on page 494, three times on the preceding page, and twice in the preface. Deaver is misspelled "Dever" (p. 626).

The binding and general get-up of the book are not up to the usual standard of the publisher.

PRACTICAL URANALYSIS AND URINARY DIAGNOSIS. A Manual for the Use of Physicians, Surgeons, and Students. By CHARLES W. PURDY, M.D., Queen's University. With Numerous Illustrations, Including Photo-Engravings and Colored Plates. Philadelphia: The F. A. Davis Co., 1894.

This work is divided into two parts: In Part I, Analysis of Urine, are considered theories of secretion and excretion of urine, composition of normal urine, abnormal urine, proteids, carbohydrates, urinary sediments, chemical sediments, anatomical sediments, and gravel and calculus; in Part II, Urinary Diagnosis, are considered diseases of the urinary organs and urinary disorders, and the urine in other diseases. Finally, an excellent appendix has been added upon the subject of Urinary Examination for Life-Insurance.

Under the above headings the author, in a volume of 350 pages, has presented the essential features of our knowledge of the urine and urinary diagnosis in a most systematic, practical, and concise form. He has evidently labored—and with considerable success—to demonstrate the relations of the chemistry of the urine to physiological processes and pathological facts. In dealing with normal urine, each constituent has been considered, so far as at present is known, in the following order: Its chemical nature and composition, its source in the economy,

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the significance of its increase or decrease in the urine, with the relations of these to metabolic processes, food-supply, physical surroundings, and tendency towards disease, and, finally, the most approved methods of its detection and determination have been described. In dealing with abnormal urine each morbid constituent has been considered in the following order: Its chemical nature and composition, its source in the economy, the clinical significance of its appearance in the urine, and, lastly, the most approved methods of its detection and determination have been described.

Due consideration is given to the examination of urine by the aid of the centrifugal method, the advantages of which the author has done much to set forth. We heartily coincide with the conclusions which the author has reached after a critical examination of the newer delicate tests for albumin,—namely, "While many of these later tests are exceedingly delicate reagents for albumin, greatly exceeding in sensitiveness the older methods, yet their increased sensitiveness is nearly always obtained at the expense of trustworthiness. Without exception the tests named give a reaction with substances in normal urine, or with substances in abnormal urine other than albumin." The most common sources of fallacy, of course, being with mucin and nucleo-albumin.

We regret that a little more space has not been allotted to the bacteriological examination of urine, a subject of growing importance. The general make-up of the book, including the type, paper, and illustrations, is praiseworthy. In conclusion, we believe the work to be one of considerable merit, and heartily recommend it to the profession.

LABORATORY GUIDE FOR THE BACTERIOLOGIST. By LANGDON FROTHINGHAM, M.D.V., Assistant in Bacteriology and Veterinary Science, Sheffield Scientific School, Yale University. Philadelphia: W. B. Saunders, 1895.

After a preliminary chapter on bacteriological technique, the manner of preparing specimens and the important staining methods are briefly described. The formula for making the various stains is given, and each step in the staining process is described without the introduction of any irrelevant matter, so that the desired information is seen at a glance. Instructions are also given for preparing the various nutrient media and for embedding tissues for cutting sections.

The book cannot fail to be useful to every student in bacteriology.

SYLLABUS OF LECTURES ON HUMAN EMBRYOLOGY. By WALTER PORTER MANTON, M.D., Professor of Clinical Gynecology and Lecturer on Obstetrics in the Detroit College of Medicine. Philadelphia: The F. A. Davis Co., 1894.

The object of this work is to furnish to students of medicine and practitioners an outline of the principal facts in human embryology. Details and theories which tend to confuse the mind of the student have been omitted, as they are out of place in a work of this kind. The

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matter has been so arranged that it may be used in the class room. The book is interleaved to afford an opportunity to make notes and additions. There is a large number of outline drawings which serve to elucidate the text. A chapter is devoted to a description of the practical work which is usually performed by the student. A glossary of the common terms used in embryology is appended, and will be found useful in saving the time necessary to consult a dictionary in regard to doubtful words.

The author has given in a small compass a faithful outline of human embryology, which both the student and the physician will find profitable reading. The printing and binding are all that could be desired.

LATIN GRAMMAR IN A NUTSHELL. Lebanon, Ohio: March Brothers.

A four-page card, of convenient size to slip into any text-book, giving in condensed form all declensions of nouns and adjectives; a complete list of conjunctions and prepositions, with meanings; prepositions governing special cases; interrogative words, with uses; a complete synopsis of the verb in all conjugations, voices, modes, and tenses; participles; special note on the gerund and gerundive; rule for prepositions in composition; special rule for the ablative and genitive; and concise note on the subjective, denoting purpose or consequence.

With this card in hand, the student saves the time and annoyance of turning through the grammar in search of the information wanted. All is had at a glance.

THE PRINCIPLES OF BACTERIOLOGY. A Practical Manual for Students and Physicians. By A. C. ABBOTT, M.D., First Assistant, Laboratory of Hygiene, University of Pennsylvania, Philadelphia. Second Edition. Philadelphia: Lea Brothers & Co., 1894.

In this book the principles of bacteriology are more clearly delineated than in any other work now before the profession. That the object of the author in presenting a knowledge of such portions of the subject as are of importance to students and practitioners of medicine has been attained is evinced by the early call for a second edition. Since, in the present edition, the text has been nearly doubled and the number of illustrations trebled, it will doubtless be found a still more useful guide to this most important field of medical science.

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UNIVERSITY
MEDICAL MAGAZINE.

MAY, 1895.

MALIGNANT ENDOCARDITIS.

By William Pepper, M.D., LL.D.,
Professor of the Theory and Practice of Medicine and of Clinical Medicine in the University of Pennsylvania,

AND

Alfred Stengel, M.D.,
Instructor in Clinical Medicine in the University of Pennsylvania.

The following cases are illustrative of that form of endocardial inflammation which it seems best to speak of under the title given above. After the masterly studies of Bouillaud and Kreisig, making the recognition of acute inflammation of the endocardium possible, there was recognized but one form of endocarditis, though, of course, the appearances of the lesion were known to vary. Kirkes, however, in 1851, first pointed out the existence of a variety, differing from that most commonly observed, and which has since been variously known as ulcerative, mycotic, necrotic, diphtheritic, and malignant endocarditis. The last name is preferable because it expresses very well the essential features by which this form of endocarditis differs from the ordinary simple or benign. The careful pathologic and bacteriologic work of recent years has shown that there is no sharp dividing line by which the benign cases can be separated from the malignant; and the coincident increase in our knowledge of the clinical features of these important diseases has similarly shown that in this direction also there is no separating line. Those terms which are based upon supposed anatomical differences fall short of satisfaction; and particularly must we set aside the name ulcerative, which is, perhaps, the most commonly used, in that it indicates but one form, or manifestation, under which malignant endocarditis may present itself. It is improper, for the same

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reason to speak of necrotic or diphtheritic endocarditis and the etiologic term mycotic must fall, since micro-organisms have been found in cases which are unquestionably of the simple or benign type.

The following cases are of particular interest in illustrating a clinical type of malignant endocarditis which is more common than is usually supposed, the form to which German authors have given the name chronic recurrent endocarditis. It is a form in which an acute process becomes engrafted upon an old disease of the valves. It may result, as does primary malignant endocarditis, from infection in the course of pneumonia, diphtheria, scarlet fever, small-pox, or other diseases of a similar nature; but it may also occur in an insidious manner and without any definite discoverable cause. The onset, therefore, may be either abrupt or it may be gradual. In the cases reported here the gradual type is illustrated. In none of them was a distinct cause detectable; in each an old endocarditis was known to exist. The symptoms were few, but sufficiently marked to make it possible to establish a proper diagnosis. Autopsy was performed in two of them, and a demonstration of the suspected morbid lesions thus obtained.

The features by which this form of endocarditis is recognized are the gradual development of irregular fever, for which no adequate explanation can be detected, and which is usually accompanied by excessive sweating, and ofttimes by chills. The patient's general condition more and more assumes the appearance of a septic state. There may be enlargement of the spleen; there may be purpuric eruption; there may be diarrhea; albumin, blood, and even tube casts may appear in the urine; sometimes the joints are swollen and red; finally and conclusively, as was the case in two of the three here reported, embolism not infrequently supervenes. Of course, embolism does occur in cases of simple endocarditis, but where there is a general septic state with irregular fever and sweats the occurrence of embolism and infarction is sufficient to direct suspicion upon the endocardium as the primary focus from which the general infection and intoxication have taken origin. The course of cases of this description is exceedingly variable; sometimes they rapidly grow worse and worse and death may occur after but a few days or weeks; in others the duration is stretched over a period of months; and cases have been observed in which the final termination was delayed for over a year. In these prolonged forms there is constantly a considerable degree of variability of the symptoms and, from time to time, such subsidence of the latter that there may seem to be an arrest or even recovery. Indeed, it is not impossible, and cases have been reported to sustain this position, that the final outcome may be the restoration of the condition of the patient to that present before the attack began, or with but slight increase of the

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chronic valvular disease. From our present views regarding the pathology of acute endocarditis it would naturally be expected that border-line cases exist which, though presenting to an extent the clinical features of malignant endocarditis, are of sufficiently benign character eventually to terminate in recovery. In other words, these cases exemplify what was said above,—viz., that no sharp dividing line exists separating the simple from the malignant forms.

CASE I.—W. A., aged 25 years, was admitted to the University Hospital May 3, 1892. The patient was born in Poland. His father, mother, and three sisters were in good health. He had had small-pox when quite young and scarlet fever, but no other illness until six months before, when he had a severe attack of rheumatism with implication of the joints, sore throat, and considerable fever. The course of this attack was very irregular; one joint after another being involved at intervals of a few days or weeks. He denies a specific history entirely; has never been a hard drinker; does not use tobacco. But his occupation—that of a coal-miner—exposed him to cold and dampness, and was doubtless the immediate cause of the rheumatic attack. Immediately following the latter, he began to have uncomfortable feelings about his heart with, sometimes, severe palpitations. There never was any edema of the feet or hands.

The note made on the day of his admission reads: The patient is pallid; has decidedly club-shaped fingers, which he says have been present since childhood. The apex-beat is displaced outward an inch beyond the mammary line, is forcible and somewhat irregular. On auscultation there is found at the apex a presystolic followed by a sharp systolic murmur, the systolic being transmitted to the axilla. At the aortic region there is a loud diastolic murmur. The patient is somewhat short of breath, but examination of his lung reveals no abnormal physical sign. The temperature is normal; the pulse somewhat collapsing.

During the first few days after admission, he complained of vague pains in the muscles and joints, and at the end of the first week there was a sharp rise of temperature. After this time, and until his death, September 5, there was at no time normal temperature, the range being from 99° to 103° F., higher in the evening than in the morning. The daily excursions averaged about 2° to 2½° F., and were sometimes as great as 4° F. He continued to complain of vague rheumatic pain, of headaches, and of excessive sweating now and then. The heart-action continued excitable and dyspnea was constantly present, increasing and decreasing with the temperature, though out of proportion to the latter. The range of the respiratory curve was from 20 to 40 inspirations per minute; and shortly before the termination the number

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reached 50. There was little change in the patient's condition from day to day, but his strength gradually decreased; his color grew more and more pallid; and the heart-action less vigorous. In the latter end of August, there began to be mild delirium in the evening and he complained that other patients were talking about his approaching death, and generally he grew more and more suspicious and irrational. Physical examination revealed a little dulness at the base of the lungs posteriorly and there were a few soft râles. This increased towards the end. He died, on September 5, of heart-failure.

The diagnosis in this case was attended with some difficulty at first. At his entrance to the wards, and for a week thereafter, there was neither fever nor any other indication of general intoxication; but simply dyspnea and the ordinary indications of lacking compensation in chronic valvular disease. At the end of the week, however, fever set in, and the man became evidently more ill. In the mean time he had been in bed, there had been nothing to induce the infection of the valves that afterwards became so clearly evident. There was, however, some complaint of pain in the joints and members, that not unnaturally suggested recurrence of rheumatism, though at no time did any of the joints exhibit evidences of active inflammation. Not, therefore, until time had made it clear that these articular manifestations were too slight to justify the belief in their being the cause of the patient's general state was it recognized that some underlying cause existed which had thus far eluded discovery. Physical examination did not furnish any data upon which an opinion could be founded; for the valvular murmurs continued exactly the same as they had been; and the other organs seemed entirely healthy. Meantime, however, the continuous septic state of the patient persisted; the heart-power grew weaker and weaker, and thus the conclusion was forced upon us that the underlying lesion was a malignant endocarditis. This may have been of rheumatic origin, or in some way dependent upon the exposure his occupation necessitated, but the subsequent rheumatoid articular pains, which persisted throughout the entire duration of the case, were more likely of the nature of the joint-pains that not infrequently associate themselves with septic conditions of various kinds. The duration of the case, four months, was remarkable, but, as has been before noted, much more protracted cases are recorded.

Autopsy.—(Only the points of interest in relation with the cardiac condition are extracted.) The pericardial sac contained 400 cubic centimetres of clear serous fluid. There were a few old and some recent fibrinous adhesions binding the two layers of the pericardium to each other. The heart was very greatly distended and weighed 770 grammes. The hydrostatic test showed the aortic leaflets to be incompetent. The

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left ventricle was greatly hypertrophied and dilated. The mitral valve segments were markedly thickened and the orifice narrowed. On the ventricular face of the anterior mitral leaflet there was a large ulcer covering it almost completely and extending upward to the aortic valve. Two of the segments of the latter were more or less completely destroyed, leaving jagged stumps. There was deep ulceration in one of the sinuses of Valsalva. The auricular surface of the mitral valve was not involved. Several of the chordæ tendineæ of the left ventricle were destroyed by ulceration, but there was no involvement of the right side of the heart. There was, therefore, old valvular thickening affecting the aortic and mitral leaflets, and recent malignant endocarditis of the same valves and of the neural endocardium.

Old scars were found in the spleen and kidneys, and in the right kidney also recent infarction.

CASE II.—J. H., aged 19 years, was admitted to the University Hospital March 27, 1893. His *family history* furnished no important data.

The notes on admission to the hospital read,—*Previous history:* He had measles at 5 years of age, after which he was healthy until he was 12 years old, when he got a severe cold from working in the wet as a plumber's boy. This ended in an attack of rheumatism in his knees and ankles, and kept him in bed eight days. About a week after this he noticed a bulging of his left chest over the precordial region. He had never noticed this before, and there was no pain in that region. About six months later, while lifting something, he struck his chest and suffered considerably from this, so much that he consulted a doctor, who first told him he had heart-trouble. He had grippe three years ago, and after it for a short time had shortness of breath and palpitation on any exertion. About four months later he had severe epistaxis, which lasted six hours and required plugging of his nares for three days. After this he was in a hospital for two weeks, and at this time his feet were swollen and sore and weak. Following this and until last October he has been fairly comfortable.

The *present illness* began last October with another attack of rheumatism, which lasted nearly six weeks (three weeks in bed). Ever since then he has had occasional slight attacks of rheumatic pain and continual headache and shortness of breath. Phosphenes appear before his eyes, and when he lies down he hears his heart-beats. It sounds like running and dropping water to him. He has an occasional sharp pain over the heart, but not very often or severe.

Physical examination showed a marked bulging over the precordia, with a very extensive apex-beat; practically the whole chest wall anteriorly pulsated with each heart-beat. On auscultation there was

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found a distinct, loud, systolic murmur at the apex, transmitted into the axilla. At the aortic interspace there was a slight systolic murmur, but it was difficult to determine whether this was transmitted or whether it was followed by a diastolic murmur. The patient's temperature was normal; the pulse varied from the normal to 100; the respirations from 20 to 30 or occasionally as many as 40 in a minute. There was slight cough. The patient remained in the hospital about three weeks, during which time his condition was never bad, and he was repeatedly used for class demonstration. He left in very good condition.

On July 14 he returned to the hospital, complaining of increased pain over the region of the heart and epigastrium, and he had decided dyspnea. The temperature when he was admitted was 101° F.; the pulse 112; respirations 30. There was found on physical examination a somewhat loud, mitral, systolic murmur, and a diastolic bruit over the aortic region, and particularly over the lower part of the sternum. After a few days there was detected a to-and-fro friction-rub at the base of the heart, which, however, was only occasionally present. The temperature remained between 100° and 101° F., but sometimes dropped suddenly to the normal and as suddenly rose again to its previous height. The patient constantly complained of drenching sweats, which were particularly annoying when he awoke from sleep. Several times there was slight chilliness, but no pronounced chills. On July 21 it was noted that there was a sudden painful swelling on the inside of the ring-finger of the right hand, which was hard and somewhat purpuric, the size of a small marble. At the same time a similar lesion more advanced was discovered on the inside of the left foot. There was considerable epicardial pain. On the 22d the patient complained of great pain over the region of the spleen, which was found considerably enlarged. There were looseness of the bowels and albumin in the urine, but no tube-casts. The great toe of the right foot showed a small infarction in the same way as the finger previously noted. On the 24th there was great pain in the abdomen, particularly in the splenic region; the abdominal muscles were tense and tender. On the 26th the temperature fell to subnormal, and there was every evidence of collapse, in which condition the patient remained until the 31st, when he died.

In this case the diagnosis offered less difficulty than in the last. The patient had been under observation with definite indications of old-standing cardiac disease in March, and had then presented neither fever nor other evidences of acute disease. At his next admission to the hospital there were decidedly irregular temperature, great sweating, and the general appearances of a systemic intoxication. A loud, diastolic, aortic murmur was audible. This had never been heard during

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the first period during which he remained in the hospital, though aortic regurgitation was then thought present and careful examinations repeatedly made. No lesion of any other organ was discovered; but the occasional pericardial frictions now entered as discordant facts to confuse the diagnosis. It is true the fever of pericarditis is not of the type found in this case, nor would a fresh pericarditis be apt to cause other systemic symptoms such as were seen in this case; but still there was unquestionably an acute process here which was capable of inducing fever. Much light was therefore shed upon the case by the occurrence, a week after the patient's entrance into the ward, of a distinct embolic lesion of the finger, and the discovery of an older one on the foot. There could now be little doubt but that an acute inflammatory lesion existed within the heart; and this grew practically to a certainty when the evidences of splenic and renal infarction supervened. The previous history and the general constitutional symptoms further made it almost positive that the endocardial lesion would prove malignant.

At the autopsy the following conditions were discovered: Pleuro-pericardial adhesions bound the pericardium in all directions, and rendered its detachment from the chest-walls exceedingly difficult. A moderate quantity of pericardial effusion was noted, but the epicardium and the pericardium were so intimately attached in places that their separation was difficult. Both layers were greatly thickened, and recent fibrinous exudation covered their surfaces. The heart, pericardium, and enclosed clots weighed 1830 grammes. The cavities were enormously dilated and the walls hypertrophied, but the muscle was soft and flabby and pale in color. The weight of the heart alone was 990 grammes. There were fresh granulations on the mitral, pulmonary, and aortic valves, and thickly set in the wall of the left auricle. A large eroding ulcer was found on the aortic segments involving two of the leaflets. Ulcerations were also noted on the mitral valve and in the left auricle. There were none in the aorta. The aortic and mitral valves were thickened and sclerotic. The spleen was enlarged (weight 500 grammes) and contained a large fresh infarction, with the remains of an old infarct showing softening. The right kidney contained several large and small recent infarctions; the left was free. The liver was congested and enlarged.

CASE III.—P. L., aged 24 years, was admitted to the University Hospital on February 1, 1892, when the following notes were made: The patient was born in Germany. He has been a healthy person until last summer, when the present illness began, and he has since been unable to continue his work. He has been in this country seven years, working first as a driver in the mines, where he was considerably exposed to cold and dampness, but lately has had more suitable occupation as a mason.

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It is difficult to obtain a satisfactory history, but he asserts that last summer he had fever, pain, and swelling of the ankles, and excessive sweating.

On admission to the hospital he was found to be extremely anemic and suffering with vague rheumatoid pains in the ankles, knees, and hands. There were no evidences of acute inflammation of the joints, though they were somewhat enlarged. There was no fever. The ends of the fingers were club-shaped and cyanosed.

On physical examination there was found great hypertrophy of the heart, the apex-beat being displaced far to the left and the impulse being strongly marked. There was a long, rumbling, presystolic murmur at the apex, and coincidently with this a palpable thrill. Immediately following this murmur there was a short, puffing, systolic bruit, best heard at the apex, but also quite distinctly in the axilla and posteriorly. At the aortic region there was a loud systolic murmur, and the second heart-sound was faintly audible. No diastolic murmur could be heard. The lungs were normal to percussion, but on auscultation dry and moist râles were audible in all parts, particularly at the bases posteriorly. The liver was slightly enlarged. The urine was scanty, highly acid; its specific gravity 1025, but it contained neither albumin nor sugar. Examination of the blood showed 4,500,000 red corpuscles and 50 per cent. of hemoglobin. There was no leucocytosis. The patient's condition remained unchanged during the first week he was in the hospital.

On February 7 the records read: There was an attack of sudden and severe pain in the splenic region this morning; but there is so much tenderness the spleen cannot be felt or outlined. There has also been some increase of the cough and bloody expectoration. Physical examination of the lungs reveals nothing but some fine liquid râles at the bases posteriorly. The air seems to enter all parts of both lungs with uniform ease. The patient's general condition now remained stationary for several weeks; but it was noted that the evening temperature was generally elevated to 100° or 101° F. On February 29 there was another attack of pain in the splenic region, and the spleen was now palpably enlarged. Cardiac excitement and dyspnea accompanied the attack. After a few days the splenic enlargement seemed to have subsided entirely, but the patient complained that he could feel a constant sense of pulsation in that region. About the middle of March attacks of excessive vomiting and of epistaxis are noted, and the patient's condition had steadily grown worse. The blood examination showed 4,300,000 red corpuscles and 45 per cent. of hemoglobin. There were many nucleated red corpuscles. The irregular mild fever continued, and there was profound prostration. The latter part of March there was considerable complaint of pain in the chest. The

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right base was dull on percussion, and on auscultation the breath-sounds in this region were exceedingly weak. The patient constantly expectorated bloody sputa. In the early part of April the patient died. Autopsy was not permitted.

Though the lesions in this case were not demonstrated post-mortem, the great similarity of the clinical features in this and in the first two will be recognized, and the diagnosis can therefore scarcely be doubtful. For some time after his entrance to the hospital there were no evidences of an acute disease. Suddenly infarctions developed, and the man showed evidences of a general toxemic state. The duration of the case was at least two months.

INFLUENZA.[1]

By James Tyson, M.D.,

Professor of Clinical Medicine, University of Pennsylvania.

Gentlemen:—I desire to take advantage of the presence of a couple of cases of influenza in the hospital to call your attention to some of the more important features of this omnipresent disease.

The first patient is a woman, a domestic, 22 years of age. There is the significant fact that her mother, brother, and three sisters died of consumption, but although this may influence its subsequent course, it can in no way be held responsible for the presence of the illness with which she was admitted, nor has her previous personal history any bearing. The history of her present illness is, briefly, as follows: She has not felt well for the past three weeks, but did not go to bed until Saturday, December 29, when she became chilly and feverish. There were no gastric symptoms, but considerable bronchial catarrh with cough, aching and pain in her limbs and back of the head. On the evening of January 2 she developed severe pain in the face and teeth. Temperature on admission, January 31, 102° F.; the next day it fell to 99.8° F.; then, on February 2, it rose to 100.2° F., exhibiting some slight irregularity; and to-day it is normal.

Contrast this case with the following history, that of a man, a grocer, 37 years of age, who has been feeling badly for the past two weeks. On the Friday previous to his admission into the hospital, which was on Wednesday morning, he had to give up work before evening came; but the next day (Saturday), being a busy one in his business, he got up and worked until 12 o'clock Saturday evening. He then came home and went to bed, where I found him Tuesday evening, with a temperature of 105° F. While there were no intestinal

[1] A clinical lecture delivered at the Hospital of the University of Pennsylvania.

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symptoms, his history with this temperature led me to believe he was going to be a very ill man. I therefore suggested that he be brought to the University Hospital. To our surprise, within the next forty-eight hours his temperature dropped to normal. This is by no means a rare course of affairs in influenza or catarrhal fever of which I regard this and the first case narrated, instances.

Before going further we may ask ourselves the question, What is influenza? I would define it to be an infectious disease, due to an organism not as yet definitely isolated, associated with catarrhal symptoms, more frequently of the respiratory system, but also involving, possibly, any of the mucous surfaces in the body, and accompanied usually with more or less muscular pain. I also believe influenza to be contagious, in proof of which I could quote many instances. We have not yet, with certainty, isolated a bacillus which is responsible for this disease, but, reasoning from analogy, there is every reason to believe that one exists, and that it will be ultimately isolated.

Influenza is of importance, more in its possibilities than in the disease itself. In the first case cited we have all the essential symptoms of a simple influenza, preceded by three weeks of ailing, perhaps quite independent of the attack, as it proved. In the latter, while the actual disease was ushered in suddenly with a chill and high fever (105° F.), there had also been symptoms of ill health for two weeks, an event which naturally made me think of typhoid fever. As a rule, we do not have a very high fever in influenza. I have, however, known cases where the temperature, at a first visit, was 106° F. This is rare.

Besides the chills and fever, aching bones and muscles, etc., the catarrhal symptoms in the respiratory passages are generally conspicuous, though not always. There may be gastric symptoms due to this cause, especially nausea, and sometimes vomiting. One of the most distressing catarrhal symptoms is acute nasal catarrh, usually associated with bronchitis. The muscular pain at times is extreme, while severe headache is also at times present. In addition to general muscular soreness and aching there is sometimes sudden stabbing pain, so severe as to prostrate the victim, as in a patient who stepping out of a railway train started to walk home, but after walking a short distance was taken with pain in his back of such a severity as to require a conveyance. Then, again, extreme prostration may come on at the very beginning of the attack. Much more rarely do we have grave pulmonary symptoms at the outset, these generally appearing later.

Given a case with all the above symptoms, how shall we manage it? Our rule of conduct should be based on the idea that every case is going to be a serious one. Most of your patients will think that they are not very ill, and insist on being up when they should be in bed. Such patients must be made to give up at once. This, and only

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this, will insure you a victory over the disease. Put your patient to bed, and in a few days, in most cases, the symptoms will abate. When the muscular pain is as severe as described, more active measures are needed, and, again, it is to be remembered, the tendency of the disease is to extreme weakness. Therefore, the indications for treatment in such cases are to relieve the pain and keep up the strength of the patient. These are met in most cases at the outset with phenacetin or acetanilide alternately with quinine, say two grains of quinine and five grains of phenacetin or acetanilide, each every four hours. If the pains are very severe, you can push the analgesics every two hours, or give larger doses at the outset until the symptoms yield. Sometimes, however, it is necessary to give a hypodermic of morphine to relieve the pain, say one-sixth to one-fourth grain. Treat pulmonary complications as you would in ordinary bronchitis. I prefer counter-irritation, when possible, to internal medication. The less unnecessary medication the better for your patient. A mustard plaster or a turpentine stupe over the chest are useful in quieting cough and promoting expectoration. The liquor potassii citratis and a few drops of wine of ipecac, with a little aconite, make an excellent expectorant. Morphine, one-twenty-fourth to one-twelfth grain to the dose may, however, be necessary to control an irritating cough. Headache is easily relieved by the combination: acetanilide gr. iii, sodium bicarb. gr. ii, and caffeine citrate gr. i, every half-hour until relieved. Or the monobromate of camphor, gr. i, may be substituted for the sodium bicarb. A capsule is a convenient shape of administration.

The most dangerous complication is pneumonia, and it is the worst sort of pneumonia that you will have to treat. The depression, also, which follows many of these cases is not only mental but also physical, and I have learned from sad experience that it is never well to give a favorable prognosis in the pneumonia cases which come on after an attack of influenza. I recall a case I attended lately with my friend Dr. Balliet, a man who had had a sharp attack of influenza with cough and dyspnea, and impairment of resonance on both sides. The breathing was hardly tubular, but broncho-vesicular. At this time the expectoration was scanty, and not rusty. There was intense depression of spirits. I saw him every day, and gradually the expectoration became freer, the cough diminished, the lungs cleared up, and the patient was regarded as convalescent. One drawback in the symptoms, however, did not impress us as seriously as it should have done. Two days before his death he exhibited some difficulty in swallowing solids, and the day before he died there was some disposition on the part of solids to return by the nostrils. The treatment extended over ten days. We saw him on a Thursday seemingly convalescent; but before our visit the next day he was dead.

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What caused this patient to die? He did not die of the local effects of the pneumonia. One lung was clear, and the other had nearly cleared up. All fever had gone; expectoration was free and easy. There was improved pulse, and there seemed every reason to believe he was recovering. Why did he perish? I am not able to answer this question with absolute confidence, though I cannot but think that it was the toxic effect of the poison of the disease upon the heart, which was paralyzed, just as happens sometimes in a child apparently convalescent from diphtheria. Such a possible termination in this case is further sustained by the apparent paralyses of the muscles of deglutition two days before death.

Four other cases may be mentioned in support of this belief. A Mrs. M., after a severe attack of influenza with marked catarrh of the lungs, died very suddenly on the seventeenth day, apparently of paralysis of the heart. Two days before her death she complained of difficulty in swallowing and a "stiff tongue," but otherwise her condition was distinctly convalescent.

Again, a strong, robust woman was attacked with severe influenza, including marked nervous depression and sleeplessness, became almost helplessly paralyzed on the right side on the tenth day, by which time the general symptoms had subsided. She was seized at 10 o'clock P.M., when her general condition seemed good and her pulse and temperature in keeping with the other symptoms. At 1 A.M. she died suddenly.[1]

The third case was that of the husband of the last described patient who died with similar suddenness three days earlier, having also had influenza. Finally, a little boy previously in excellent health, convalescent from influenza, fell dead while playing, repeating identically the history of diphtheria in this respect. Such a termination, though unusual, is always possible. Can it be met by treatment? Theoretically, yes; practically, it is not so certain. The drug indicated is strychnine. Given any case of influenza which does not speedily recover, or which has left any bad after-effects upon the heart, one-thirtieth of a grain of strychnine should be ordered four times per day, or even oftener. It is astonishing how we can gradually increase the dose of these poisonous drugs without material harm. I was told by a fellow-physician that one-twentieth of a grain of strychnine was given every hour for forty-eight hours consecutively without harmful effect. I do not advise you, especially as beginners, to follow his example, but such experience certainly makes it safe to give one-thirtieth of a grain four times a day to an adult. Of course, it is necessary to watch for

[1] It must be allowed that the death here was possibly due to an apoplexy which was independent of the influenza.

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idiosyncrasies of individuals. With this, free stimulation with alcohol should be associated.

Another serious danger of influenza is its tendency to convert harmless, often latent, disease into serious disease. I especially refer to kidney- and heart-disease. One of the results of the more recent practice by the life-insurance companies, in examining the urine of all persons seeking insurance, is the discovery that albuminuria is present in many persons who are quite free from other symptoms,—a condition not serious in itself. If such a man gets influenza, however, his mild albuminuria will sometimes become a serious one. The same is true of heart-disease. A murmur unattended with other symptoms may after an attack of influenza become associated with other symptoms, and assume a serious import.

SOME DIFFICULTIES IN THE DIAGNOSIS OF PREGNANCY.

By Barton Cooke Hirst, M.D.,

Professor of Obstetrics, University of Pennsylvania.

The general physician cannot be reminded too frequently that mistakes in the diagnosis of pregnancy are easily and frequently made; and that such mistakes are often attended with disastrous consequences. To the inexperienced, it must seem that pregnancy should be recognized without difficulty. Every physician has ample opportunity to become familiar with its signs, and these signs are so distinctive. A little practical experience, however, soon convinces any one that under certain circumstances the recognition of pregnancy is difficult or well-nigh impossible unless the physician proceeds upon the assumption that any woman between the ages of 9 and 59 years may be pregnant, and that every abdominal tumor is a pregnant womb, till it is proved to be something else; and then subjects the woman to a routine and methodical examination, not forgetting any sign that might present itself to the senses of touch, sight, and hearing.

Every physician receives in time an impressive and often painful lesson in the importance of adhering to the above rule. Or, if he is fortunate enough to escape a blunder himself, he receives many a warning of the danger of a mistake in the diagnosis of pregnancy from the experiences of his friends. It seems to me that more than the usual number of such mistakes have come under my observation. It is certain that my own experience furnishes as remarkable instances as can be found. A few years ago a young woman was sent to the University Hospital with a note from her physician stating that she had an ova-

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rian cyst, requiring an operation. It was remarked incidentally in the letter that she could not be pregnant, for her family was one of the utmost respectability, and she was unmarried. Unfortunately, respectability proved no bar to the penetration of a spermatozoon, and she was delivered shortly afterwards in the University Maternity.

I was called some time ago as expert witness to a neighboring city in a trial for damages against a physician on the following grounds: A rachitic dwarf applied to a medical man for advice in what she supposed to be pregnancy. Her sickness had stopped and her abdomen was enlarging. The physician believing her to be pregnant watched the course of gestation with interest, for he realized that delivery through the parturient tract was impossible on account of the deformity in the pelvis, and he had determined to perform Cesarean section. At the end of the supposed pregnancy the operation was performed before quite a large audience. There was nothing abnormal in the abdomen except a huge pad of omental fat.

In one case under my care during labor a diagnosis of gastric cancer had been made on account of the vomiting of pregnancy; in another, the pregnant womb had been taken for a floating spleen of large proportions, and an operation had been proposed for its removal.

The wife of an English officer came under my charge for her approaching confinement with the following history: She had been married a year. She went to a large city in the interior of India shortly after her marriage, and before long noticed signs which, she believed, indicated pregnancy. She consulted the professor of obstetrics in the local medical school, an English physician, who assured her she was mistaken. Her symptoms continued, however, and an Indian midwife made the diagnosis of pregnancy. The lady again consulted her physician, who again assured her that she was not pregnant; that he was a professor and could not be wrong! And to convince her he passed a sound into the womb. There was immediately a gush of fluid, and from that time till the end of pregnancy, four and a half months, liquor amnii flowed almost continuously from the vagina. But in spite of this discharge, and in spite of a rough sea-voyage from India to England, and from England to America, the duration of pregnancy was not shortened by a day. After labor I found a perforation in the membranes near the edge of the placenta.

A woman was once sent to me from one of the Southern States for hysterectomy on account of what was thought to be a fibroid tumor. She was pregnant with twins. Further instances might be cited for several pages, but the recountal of the mistakes, many of them resembling one another, would prove tiresome. One more, however, should be

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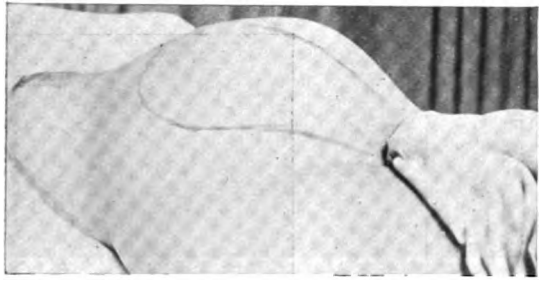

FIG. 1.—Tympanitic distention of pregnant abdomen. The outline shows the part played by the womb in the distention.

FIG. 2.—Abnormal obesity.

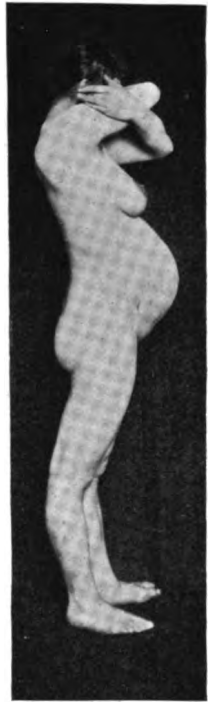

FIG. 3.—Normal distention in a primipara at term.

FIG. 4.—Pendulous belly of rachitis. (High forceps.)

FIG. 5.—Pendulous belly of rachitis. I-gravida. (Cesarean section)

FIG. 6.—Hydramnios.

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FIG. 7.—Normal distention at seventh month. II-gravida.

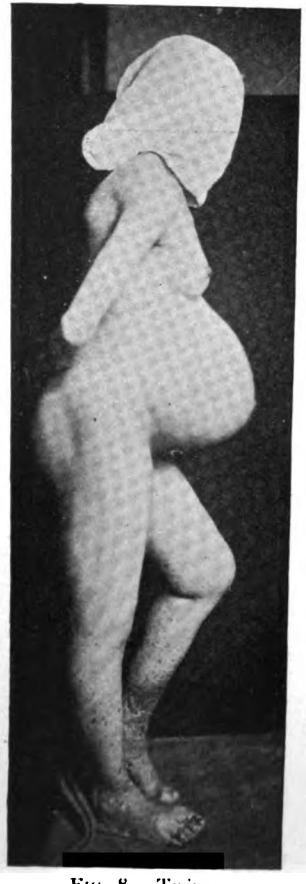

FIG. 8.—Twins.

FIG. 9.—Pendulous belly of rachitis; fat and tympany.

FIG. 10.—Hydramnios.

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referred to. Having told several tales upon others, it is only fair that I should tell one upon myself. A young woman applied for admission to the University Maternity, stating that she expected her confinement at any moment. As she stood before me, I observed with surprise that there was no abdominal protrusion at all, and I told her she must be mistaken. She replied that just nine months before there had been a single illicit intercourse, and that she had not seen her sickness since. On examination, I found a globular tumor at the level of the umbilicus, four inches in breadth, apparently connected by a slender pedicle with the pelvic organs. I assured her that if her story was true she could not be pregnant. She was sent to a hospital, and on the following day was examined under ether by myself and by my colleague. We agreed that she could not be pregnant at term, and we found no evidence of pregnancy at all. She was then told that if her story was true she was not pregnant, but had a tumor requiring abdominal section. She still insisted that the only opportunity for impregnation had occurred but once, nine months before. Her abdomen was opened the following day, and a pregnant womb was found very much compressed and attached to the cervix by an enormously lengthened lower uterine segment.

The girl luckily was unharmed by the exploratory incision, and was delivered three months later. It appeared subsequently that she had been exposed to impregnation at repeated intervals during three months; that her menstruation had really stopped after the first exposure; that fearing pregnancy she had laced herself as tight as she possibly could, and had continued this practice till I saw her. The compression of the abdomen must have been extreme to have crowded the womb into the situation it occupied, and to have so much reduced its size.

One important fact must be regarded in the diagnosis of pregnancy. This is the variability in the degree and kind of abdominal distention in the latter months. For some years I have collected photographs of pregnant women, and a study of them is most instructive in this respect. Those that are reproduced in the illustrations show the commoner irregularities dependent upon pendulous belly, hydramnios, twins, tympany, and fat. Fig. 1 represents a woman who was denied admission to a maternity hospital, on the ground that she was not pregnant. She was pregnant at term, but extreme tympany masked the pregnant womb.

Fig. 2 shows the enormous enlargement of the abdomen possible in a non-pregnant woman, on account of extreme obesity of the omentum and of the abdominal walls. The woman came under my notice in the dispensary of the Howard Hospital.

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ON DIGITAL EXAMINATION AND TREATMENT OF CERTAIN MORBID CONDITIONS OF THE NASAL CHAMBER.

By Harrison Allen, M.D.

From among a large number of cases of nasal catarrh there will be noted instances of headache which unfit the sufferer for the duties of life; mental oppression; dulness of perception; loss of memory; and morbid apprehension. Neurasthenia of a grave type is occasionally recognized. Subjects may also be epileptic, and the number and severity of the seizures be aggravated by the disease. Catarrhal deafness is frequently commensural with nasal obstruction. Frequently patients are victims of exhaustive attacks of sneezing, which interfere with many occupations and depress the general strength. As is well known, at least one form of asthma is always associated with rhinitis, especially the form which leads to the development of polypus. What is to be done for one or more of these conditions after the vain use of detergents, astringents, and caustics; or when the irregularities of the septum have been overcome by operation and all hope of improvement from the administration of alteratives or from change of climate has been abandoned? May not the situation be sufficiently grave to urge the medical attendant to other efforts? I do not hesitate to answer this question in the affirmative. I allude to the investigation of the conditions which excite the local distress by digital examination of the nasal passages. In surgical practice it is impossible to over-estimate the value of the sense of touch in making a diagnosis. If to those aids in studying nasal diseases which are already in our possession we can add this valuable auxiliary, in my opinion, a step forward is taken. Is such a step safe? Is it practicable? I reply that it is both safe and practicable.

I venture in this connection to formulate the result of my studies which have now extended over ten years.[1] The circumstances which led me to institute such an investigation were as follows:

In the spring of 1885 I had under my care a child, 10 years of age, who was suffering from fetid nasal catarrh, accompanied with very marked deformity of the external nose, due to a depression of the nasal bones. The patient proved to be intractable, and I suggested to the parents that ether be given in the first stage, in order that the parts be thoroughly cleansed with the hope that on subsequent occasions treat-

[1] A short account of this method appeared in the American Journal of the Medical Sciences, April, 1886.

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ment would be conducted more satisfactorily. Consent being given, I administered ether and carefully removed from the nasal passages and pharynx large quantities of inspissated mucus. It occurred to me at the time that it would be well to determine to what extent the finger could be inserted into the nostril. The little finger, being anointed with cosmoline, was passed into one of the nasal passages; then I noted that the finger was disposed to pass up and back, and that I could feel the anterior end of the middle turbinated bone on each side. This structure was felt as a hard resistant mass, apparently necrotic and devoid of membrane. From it projected a number of spine-like processes. I was so struck with the conditions which I had detected that I informed the parents that there was no likelihood of local treatment in the way of tampons, powders, sprays, douches, etc., relieving the distress, and I asked permission to remove the dead bone at the anterior end of the middle turbinal; but I could not get their consent, being compelled to acknowledge that it was a procedure which I had never before attempted nor known to be attempted by others.

Reflecting upon the above facts brought forcibly to my mind the case of an unfortunate army officer who was lost to his country by means of the unchecked ravages of nasal disease.

A. B., aged 41 years, a distinguished officer in the United States army, reported September 17, 1880. He had had hawking—*i.e.*, a disposition to clear the throat—since boyhood. The chief source of complaint was a dull, dazed feeling about the brow, which began in 1866. Occasionally in severe exacerbations this feeling extended to the vertex. He compared the sensation to that of a veil which had suddenly dropped down over his faculties. At such times his mental activity was impaired. He conceived that this condition would interfere with his efficiency as an officer, and declared that if he could not be improved he must resign from the service. Since 1868 a congestion of the lining membrane of the left middle ear added to his annoyance. He describes this as "a creaking," and by a voluntary effort on his part a slight noise of a high pitch could be distinctly detected by the observer when the ear was placed close to that of the patient. There was no history of deafness or other aural trouble. The patient became morbidly sensitive respecting the condition of the ear, and had consulted many authorities both in this country and in Europe.

The seventh day after he placed himself under my charge I secured a view of the posterior parts. They appeared to be normal in appearance. Examination of the pharynx showed its membrane to be red, thick, and glistening. The parts were very irritable, and no view of the choanæ was obtained. The septum, as seen from in front, was inclined to a moderate degree to the left, but no appearance of obstruc-

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tion was detected. A large amount of mucus was seen on the left side. That which passed anteriorly was normal in consistence, but that which passed into the pharynx was thicker and contained small round masses of a slate color. In the last six or eight months the posterior discharge had been of a chocolate or even red color.

It was not until October 21 that the general reduction of the turgescence of the interior of the nose enabled me to discern the middle turbinals from in front. They presented nothing unusual. It is true they were in contact with the septum, but a probe could be passed easily between them. I had an opportunity from the date of reporting to November 12 of conducting a systematic local treatment at intervals of twice a week. The anterior ends of the middle turbinals on each side were cauterized with a saturated solution of the nitrate of silver, or light applications were made with the galvano-cautery. Dobell's solution and afterwards a weak solution of carbolic acid were used in the form of sprays. The general health was excellent, and nothing appeared to be demanded in the way of general treatment. By November 24 he was compelled to report for duty at a Western post, scarcely, if at all, improved. When he could reasonably ask for a second leave of absence, the patient proposed to undergo a second treatment. On March 15, 1881, he committed suicide by shooting himself through the roof of the mouth with a pistol of the army pattern, having a ball of the calibre forty-five. It had been noted by the medical officers on duty at the post that the officer had been for some time before his death extremely melancholic. It, of course, remained entirely unknown what cause led to the suicidal act; but I could not help making the reflection that the persistence of the distressing mental condition for which he had reported had in time unbalanced his judgment and developed a suicidal mania, the violent and sudden outbursts of which are well known.

This case made a strong impression upon my mind. A valuable life had been sacrificed. If so gross a condition as a mass of dead bone in the child's case had escaped my notice, why was it not possible in this patient's also for me to have failed to detect the existence of an essential morbid state. In cases of obstinate catarrh, where the symptoms were of a grave type, why could it not be profitable to explore the parts carefully? I determined to act upon this impression, and proposed to those patients who were at that time under my care, suffering from inveterate forms of nasal catarrh, that they permit me to etherize them and to determine by digital examination, as far as might be possible, the state of the nasal chambers.

The following rules may be here given for conducting the examination and divulsion: Carefully cleanse and disinfect the hands.

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Apply cosmoline or terraline to the little finger of the left hand. Insert the finger in the nostril. The triangular cartilage will yield slightly. The parts touched convey different impressions since the variation in the component parts of the chamber is great. As a rule, the inferior turbinal can be defined at its side and the middle turbinal at its anterior portion. The parts which are beyond reach of the finger are those which lie between its tip and the choana and are embraced within the region of the palatal bone. Of course, all structures of the normal chambers which lie above the level of the middle turbinal are inaccessible. Should the anterior end of the middle turbinated bone be found covered with thick and softened tissue, which is readily pressed away, the posterior end of the semi-attached piece may lie beyond the finger-tip. The pedicle to the pendent mass may be readily removed by treating the whole as though it were a polypus.

In this way, as recorded in the above summary, began a practice which has since become a frequent one with me of making digital examinations of the nasal passages in all obscure forms of nasal disease.

The following conditions are those for which I have successfully interfered:

(1) The form which is due to a constitutional condition.

(2) The form which is associated with periodic reflex phenomena.

(3) The form which is dependent upon sclerosis (with or without atrophy or necrosis) of the anterior end of the middle turbinal.

(4) The form associated with hyperplasia of the anterior end of the middle turbinal.

(5) The form associated with thin, highly arched, inferior turbinals which project far into the lumen of the nasal chamber.

I.—The Form which is Due to a Constitutional Condition.

Case I.—E. W., a retired merchant, aged 59 years reported, January 25, 1887. He had been a very free liver for many years. For four years he complained of a nasal discharge which was anterior only. There was excessive pharyngeal irritability, and a yellowish brown fur persistently covered the base of the tongue. The chief source of distress was a morbid sensation of the pharynx which he described as "dryness and tickling." The basi-lingual veins were exceptionally large. Both sides of the epiglottis touched the walls of the pharynx. The constitutional condition was not favorable; one brother having died of phthisis and one of the sequelæ of epilepsy. The patient suffered from atonic dyspepsia, which most probably had resulted from prolonged libations and high living. He complained

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of frontal and occipital headache which appeared to be confined, for the most part, to the early part of the day.

Both nasal passages were very narrow. The anterior ends of the inferior turbinated bones were the seat of chronic infiltrations. The septum was slightly deflected to the left and was sinuate. Beyond this nothing was seen.

The treatment in this case was initiated by local depletions of the septum, and the applications of a weak solution of the liquid ferri perchloride to the pharynx. The patient was seen twice a week, and at the end of a month the sensation in the pharynx of dryness and tickling had diminished, but the discharge from the nostrils remained about the same. It is evident that an unfavorable constitutional condition need not prevent recourse to operative procedure.

I now suggested that the chambers be examined while the patient was under the influence of ether. On February 25 the patient submitted to the manipulation. By March 1, the fourth day after the operation, the patient reported that the pain over the brow and the bridge of the nose was gone. By March 15 the sensation of dryness and tickling had entirely disappeared, and there was scarcely any discharge from the nose. In a word, the patient was relieved from all his distress, and remained so until October 6, when he reported. Having spent the summer in Europe, he contracted a cold in Germany on September 24, and had rheumatic pain in the left foot since that date. The patient remained under observation at long intervals until March 12, 1888. During all this time the nasal and pharyngeal symptoms had practically disappeared, but the tongue remained covered with the basal fur, and the abdominal conditions remained unchanged.

Remarks.—It is evident that in this case two distinct factors were present. First, the facts of high living and prolonged moderate drinking in a man past middle life. These conditions caused impairment of digestion, and a foul tongue. Secondly, an irritative pharynx with nasal discharge dependent upon hyperplasia of the anterior ends of the middle turbinated bones. Notwithstanding the unfavorable general state of the patient the treatment proved as satisfactory as in other instances to be mentioned.

CASE II.—A married woman, aged 40 years, reported April 3, 1888. She was one of twin sisters, the other dying at the age of a month. The patient had had nasal disease from birth, and at the age of 18 months had paralysis of the entire left side of the body. The exact nature of this condition is not known, but the left lower extremity is slightly shorter than the right. She has always been a mouth-breather, has been subject to muco-purulent discharges, and is exceedingly susceptible to slight changes in the atmosphere. Attacks

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incident to this change, which she describes as "taking cold," are accompanied with increase of the characteristic discharge. Examination of the naso-pharynx showed the space to be somewhat contracted and the prominence of the axis to be marked; but the choanæ, though patulous, were small and of the infantile type. There was no adenoid growth. The roof of the mouth retained a high arch and was contracted. The teeth were irregular, and the epiglottis broad, symmetrical, but not compressed. Examination of the nasal passages from in front showed the anterior ends of the middle turbinated bones to be hypertrophied. They were so large and responded to the local effect of cocaine so imperfectly that no view was obtained of the parts beyond them. It was observed, however, that the left inferior turbinated bone was united to the septum by a synechial band.

Believing the conditions to be congenital and not disassociated with the small size of the choanæ, I proposed an examination under ether. I accordingly placed the patient under the full influence of ether and inserted the little finger of the right hand into the left nasal chamber through the space between the septum and the inferior turbinated bone. I detected an abrupt angular deflection to the left side of the bone at the lower border of the triangular notch. This was removed with the saw. At the same time the synechial band between the inferior turbinal and the septum was severed with a pair of scissors. Both chambers were narrowed towards the posterior part, so that it was impossible to determine their exact condition. The finger was next inserted into the naso-pharynx above the velum and carried up against the choana. A probe was then passed from in front back to the tip of the finger. In this way the impression was confirmed, that was received by the rhinoscopic inspection, that the left choana, though small, was patulous. A similar examination was made of the right side.

The impression was received that the choanæ were too small for the normal drainage of the nose, and that the operation to increase the diameters was warrantable. A burr-drill was next taken, measuring three millimetres in diameter, and each of the nasal chambers was opened through to the naso-pharynx on the plane of the floor of the nose.

The patient took the anesthetic very well and bore the operation admirably. By April 21 she reported, and the local treatments were continued. These consisted in the use of the carbolic acid solution to the pharynx and nasal chambers, and liquid cosmoline applied to the surfaces which had been operated upon with the saw and the burr-drill.

The patient acknowledged marked improvement. The discharge

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was diminished, there was less dyspnea, and, as the patient expressed it, she felt "generally better."

On June 2, the patient reported with the history of an attack of dyspnea, and an increase of mucus in the pharynx. A number of furuncles had appeared upon the face. The discharge had an inclination to become inspissated at the roof of the naso-pharynx and was removed with great difficulty. There was a slight pain in the right ear with a sensation of crackling and dulness of hearing. The fact that this attack occurred in the opening of summer weather, about two months after the operation, led me to believe that the conditions were in no way associated. I treated the case as one of acute catarrh of the nose and of the pharynx, and in a short time the symptoms subsided, and she returned to a state similar to that directly following the operation. The patient still complained of a disposition to contract cold, which very apparently caused the obstruction of the nasal passages with a return of the mouth-breathing. Careful inspection convinced me that the hypertrophy of the anterior ends of the inferior turbinal had something to do with this condition. It was also a noteworthy fact that, since the choanæ were increased in diameter by the use of the burr-drill, there was a disposition for the membrane over the turbinated bone to project into the naso-pharynx. These masses were as variable in form as the anterior were constant. Those last named were not contracted appreciably by the action of the cocaine, but those first named were susceptible to it. While the masses were sufficient to obstruct the choanæ, a single application of a 4-per-cent. solution of cocaine would be followed by their contraction and withdrawal, too. I inferred from this peculiarity that the posterior masses might probably be left to themselves; whereas the anterior masses having shown no disposition to reduction in size had best be removed. This treatment was begun October 2, 1888, and continued until June 2, 1889. The galvano-cautery, as a chief agent, and chromic acid were at different times used. The treatments were made at intervals of twice a week. With the exception of being susceptible to slight attacks of coryza, she remained well.

Remarks.—In this complicated case are found associated congenitally contracted choanæ and anterior hypertrophy of the inferior turbinated bone. A predisposition to catarrhal inflammation of the middle ear also existed. In a similar case I would remove the anterior hypertrophies at the time of operation for enlarging the diameters of the choanæ.

CASE III.—Miss L. H., aged 30 years, reported January 1, 1887. She was a highly strumous subject with light hair and fair skin. There was a history of phthisis in her immediate family. She has had

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from childhood a chronic muco-purulent nasal catarrh. It was probably traceable to an attack of scarlet fever at the eighth year. The nutrition was very faulty. She complained of impaired circulation, cold hands and feet, which were disposed to be swollen in the morning, and constant headache at the occiput and the top of the head. The nostrils were excoriated. The ordinary signs of chronic pharyngitis were present, and the anterior end of the left middle turbinated bone was the seat of a chronic hyperplasia. It appeared in this case that a constitutional cause was the essential factor.

After a month of careful observation and treatment I became convinced that some local cause was exciting irritation; since a well-defined localized expression of disease was detected in the left nasal passage. I determined to assume the responsibility of examining the parts under ether. I etherized the patient March 5, and effected the usual manipulation of examining the anterior ends of the left middle turbinated bone. It was found to be hard, thickened, and the membrane soft and degenerated. This membrane was stripped off, but no attempt was made to remove the anterior end of the bone itself. As was anticipated, the patient did not bear the treatment well. She suffered on the second day from acute pain on the bridge of the nose, headache, and reflex neuralgic pain caused by a decayed tooth on the affected side. The tongue, however, remained clean, and there was no fever. On the third day the corresponding side of the face became swollen, a moderate amount of cellulitis developed, and the patient had the appearance usually seen in alveolar abscess. There was a slight increase of pharyngitis and some swelling on the left side of the larynx. Within a week after the operation she declared her headache entirely gone. She acknowledged a great improvement in the character of the discharge which was only felt at the time of a recurrence of the acute catarrh. The patient was greatly improved after the operation.

Remarks.—We have here an illustration of what can be accomplished under the most unfavorable circumstances, after removing diseased tissue in the nose of a strumous subject with rhinitis of high grade. It is fair to suppose that the symptoms following the operation were as severe as were likely to occur under any circumstances, but as defined in this case it will be seen that all that occurred was a mild form of "swollen face" and a slight exacerbation of the catarrhal symptoms with neuralgic reflexes.

CASE IV.—C. T., aged thirty-five years, reported March 7, 1887. He complained of the symptoms of chronic pharyngitis, constant pain referred to the throat at the region of the hyoid bone, a disposition for the accumulation of tenacious mucus accompanied with an irritating

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laryngeal cough. A sense of heat was referred to the bridge of the nose. Occasionally a slight epistaxis occurred. The pharynx was of a dull red color with considerable submucous edema. The larynx was congested in appearance on the tracheal rings, the membrane over the arytenoid masses slightly infiltrated and the interarytenoid commissure thickened. Inspection of the nasal chamber from in front revealed a perforating ulcer the size of a cherry. The edges of the ulcer were covered with tenacious crusts and the triangular cartilage was of a deep-red color.

The patient acknowledged the syphilitic origin of his affection. Iodide of potassium and bichloride of mercury were ordered internally and Sir Charles Bell's gargle for the throat. The patient slowly improved. At the end of a month, on April 5, 1887, the progress not being satisfactory, I recommended that the parts within the nostril be explored. I was not surprised when I found both middle turbinated bones were pressed against the septum and each covered with thick vascular mucous membrane. The usual procedure was initiated to separate the parts, and the degenerated membrane was removed from the anterior ends of both bones. The bleeding was free but ceased spontaneously. On June 25, the patient considered himself entirely well. Indeed, he had remained so comfortable that he reported but once or twice from the date of the operation.

Five months after the operation the patient reported to say that the parts had not troubled him since the operation, while the ulcer remained unhealed though no longer covered with tenacious crusts. His complaint was chiefly one of dryness of the throat with a slight laryngeal cough. The patient remained under my care, calling at my office at long intervals through the winter of 1887 and 1888.

Remarks.—This case is an illustration of syphilitic pharyngitis and laryngitis complicated by hyperplasia at the anterior ends of both middle turbinated bones which were probably of syphilitic origin, since they were associated with a perforated septal ulcer. It is shown by the course pursued in this case that the removal of diseased tissue in the nostrils and the relief of adventitious pressure was followed by the same good results as are seen in non-syphilitic patients. At the same time, as might be expected, the procedure had no influence over the general disposition of the pharynx to become again involved under the influence of the constitutional cause.

Résumé.—In Group I it is recognized that a catarrhal state of the nose and throat is maintained by incipient cirrhosis of the liver and gastric catarrh. In Cases II and III the morbid flux was due to obscure states of the general nutrition, and held to be scrofulous in

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character. Case IV was an instance of the benefit arising from digital examination in secondary syphilis.

It is difficult to determine when a given morbid condition is due to constitutional defects,—that is to say, when they are hereditary or when they are due simply to the results of the impairment of the general vitality from local causes situated elsewhere. In illustration of the group last named, I can recall a most instructive case of a lady who, being an invalid from chronic ovarian disease, suffered among other conditions from pseudo-membranous enteritis, and had recurrent nasal hemorrhage from a large septal ulceration. Both of these intensely-obstinate conditions instantly disappeared and never returned after the operation of oöphorectomy was performed. The nasal symptoms in this case were catarrhal reflexes, and yet, in the older classifications of writers, would have been included under diathesis. To conclude, nasal catarrh in some of its forms is one of a small group of disorders which is dependent on diathesis. It should exclude syphilis, but may be embraced in lithemia, gout and scrofula. It is sometimes exceedingly difficult to determine under which group a given case should be included.

II.—The Form which is Associated with Periodic Reflex Phenomena.

Case V.—C. S. D., aged 34 years, reported March 4, 1887. He had suffered from chronic nasal catarrh from childhood, and from hay fever the last fifteen years. He was subject to attacks both in the spring and autumn of each year. The patient has also suffered from chronic headache and nausea. The patient lived in a distant part of Pennsylvania, and it was not until May 17 of the same year that he reported with the object in view of submitting to an examination under ether of the nasal passages.

The anterior end of the middle turbinated bone was found in a peculiar condition. A long, membranous, dog-ear-like mass hung down from the bone as far as the level of the inferior turbinal. It lay against the septum, but was not united to it. I did not remove this membrane, as I had never met with a similar condition, but contented myself by gently inserting the tip of my little finger between it and the septum, pushing the mass well out to the outer side of the chamber. After twenty-four hours' rest in his chamber the patient returned to his home.

I did not expect any marked improvement in this case. I was not surprised when he informed me on July 5 that his usual early summer attack had already announced itself. However, in the early fall he wrote stating that the attack beginning thus early had lasted but for a

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short time, and the symptoms somewhat abruptly disappeared. In the summer of 1888 the attack again returned, but subsided after a few days' duration. A similar experience was reported as occurring in the ensuing year. I have seen this patient twice since the date of the manipulation, at times when he was not suffering from attacks, and conducted short treatments with the object in view of reducing the size of the outgrowth from the right middle turbinal.

Remarks.—This case has been reported by Dr. C. W. Beard in his monograph.[1] It is difficult to account for the result following such a simple manipulation as I have recorded, and I have frankly to acknowledge I did not remove a single pathological condition which was at that time recognized; nevertheless, the improvement in the patient's condition has been marked, whether such a result can be attributed to mental impression or to the removal of the pressure of the membranous mass against the septum, it is difficult to decide.

CASE VI.—V. C., aged 45 years, of gouty diathesis, reported in the fall of 1884. He has been a mouth-breather from childhood, and from early youth has been subject to "sick headache." At the thirty-fifth year he suffered from acute rheumatism. In the period of convalescence he complained of nocturnal sensations of dryness in the mouth. In September, 1880, he caught a severe "cold in the head," which lasted six weeks, and from that date until the one upon which he reported a similar illness of equal duration had occurred in the same month of each year. He reported that in 1883 the attack was distinctly "hay fever like," and accompanied with asthma. In the periods between the seizures he detected a tendency to catarrh from slight causes, complicated with asthma, sneezing, and various morbid sensations, which were referred to the region of the ascending process of the maxilla. His general condition was bad, being highly neurotic. He suffered from morbid apprehension and hysterical paroxysms of weeping. It might be inferred from this account that the patient was incapacitated, but no conclusion could be more erroneous. He was actively engaged in his profession, and to the casual observer would have appeared to be well.

Examination under ether, April 20, 1888, showed the anterior part of the right middle turbinated bone with a dog-ear-like membranous appendage, as in Case V. The bony lamina itself was thin and yielding, and was readily removed by pressure with the finger. The patient did very well, and entirely escaped from a hay-fever attack the ensuing summer. He has never had any asthmatic symptoms since the date of operation. In 1889, however, the September attack of catarrh returned

[1] Hay Fever and Summer Catarrh, p. 196.

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in a greatly ameliorated form. I proposed a second operation with a view of enlarging the diameters of the right nasal chamber in the region of the triangular cartilage of the septum. The patient became cyanotic while taking the ether, and I desisted from all attempts to explore the chambers. Notwithstanding this failure, the patient at this date (April, 1890) is greatly relieved of the disposition to periodic catarrh, but acknowledges a feeling of nasal obstruction which demands the constant use of cocaine.

Remarks.—The following conclusions may be drawn from this case: A constitutional morbid disposition is the dominant clinical factor, and that the removal of the diseased tissue, which was conspicuously followed by relief in Case IV, here in this case gave amelioration only. The general conditions were of importance in accounting for the imperfect result, for they depressed all vital resources, interfered with nutrition, and rendered the patient morbidly sensitive to slight influences.

CASE VII.—C. P., aged 35 years, reported March 7, 1886. He had suffered for fifteen years, in the month of August, from hay fever in its typical form. He was highly neurotic, emaciated, and was never at any time well. He was subject to insomnia and to attacks of severe migraine-like headaches. A disposition to nasal obstruction induced him to make frequent applications of cocaine to the nostrils. At the time of reporting, he was using hypnotics in their different forms to secure sleep. The patient's general condition was most unfavorable, and he appeared to be on the verge of a general breakdown. The symptoms were at first sight easily explained by referring them to the general state of the system; yet, upon examination of the nostrils, it was seen that both the middle turbinated bones showed results of long-standing infiltrations, and while no pendulous membranous lappets were presented and no pressure between the sides of the septum or external wall of the nasal chamber existed, yet the bones were everywhere covered with an irritable mucous membrane and concealed by mucoid secretion. The maxillary portion of the vomer was enormously thickened, spread on both sides, and nearly occluded the anterior passages at the level of the anterior meati.

The treatment consisted in the use of detergents and nitrate of silver. After the treatment had been continued for a month, I proposed to him to make an examination under ether and at the same time to reduce the size of the maxillary portion of the septum. I sawed away all portions of the thickened bone, which answered to the premaxillary areas so that there was no disposition for the inferior turbinals to lie in contact therewith. He acknowledged considerable comfort from this

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treatment and remained entirely well, having no hay fever attack the ensuing summer.

The middle turbinals were covered by a thick, softened layer of membrane, which was easily removed. The bones themselves were found to be excessively hard hyperostosed and gave the impression of being eburnated. It is needless to say that no attempt was made to interfere with them. Four years afterwards Mr. P. made me the following report: He could now breathe at all times through the nostrils, yet, notwithstanding this, he complained of a sense of partial closure. The benefit produced by the partial removal of the hypertrophy of the septum was marked. The nostrils were for a long time free. There was a gradual return of the distress which the patient attributed to a reformation of hypertrophied mucous membrane. Insomnia persists. The patient attributes this to the free use of cocaine. Circumstances have prevented a renewal of the treatment, and the present state of the patient's health does not appear to be an improvement over that of his first report.

Remarks.—The most striking feature in this case is the presence of dense hyperostosed middle turbinals. Notwithstanding the limitations imposed by the hyperostosis the local treatment resulted in benefit.

CASE VIII.—Mrs. A. T. L., aged 49 years, reported October 6, 1887. From her fifteenth year she has suffered from attacks of sore throat with nasal obstruction. Since her twenty-ninth year she has been subject to annual attacks of hay fever, and has suffered from periodical frontal headache of a severe type from her eleventh year. She complained of a foul odor which was certainly subjective, and could be compared to the odor of decomposition. The nasal discharge in this case was not marked. It seemed to be moderate in amount; the discharge was for the most part posterior.

The patient is of a distinctly neurotic type, and all the symptoms of which she reported had been attributed by her physician to subjective causes. These elements in the case rendered it one of excessive difficulty to determine which of her complaints were actual and due to local disease and which were subjective and purely imaginative.

The pharynx was excessively irritable and no view of the nasopharynx was obtainable. The roof of the palate was, in part, occupied by a large exostosis. The vault was narrow and high. The right inferior turbinated bone was the seat of a fibroid change anteriorly. Both nasal chambers were excessively narrowed, with no view of the middle turbinated bone obtainable beyond an exceedingly small and inconspicuous line. After careful consideration of all the circumstances, I proposed that the patient be etherized and the nose examined. I was well aware of the responsibility of making this recommendation in the

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face of the assertions of other practitioners that the symptoms were not excited by local disease. I was, therefore, much gratified to find as a result of the examination the anterior ends of the left middle turbinated bone to be globose and covered with a thick vascular membrane, which came away with the gentlest pressure of the finger, leaving a portion of softened bone which, as a result of additional manipulation, came away. The right side was not touched.

The patient did very well after the operation, and by December 8 she reported at my office with the statement that the headaches were very much better, and the subjective odor was entirely gone. She complained of a pain on the right side of the head (that of the left being entirely relieved), and persisted in her request that an operation be performed on the right side. I deemed this to be imprudent while her mental condition was not satisfactory, and I held it practicable that I may have removed the greater part of the diseased tissue in any event; but the persistent complaint of neuralgic pain in the right temple led me to etherize the patient a second time on March 2, 1889, when, not altogether to my surprise, I found the left middle turbinated bone not globose, not vascular, and the manipulation of the finger did not remove any portion of its membrane. In a word, no indications for the removal of the anterior end of the middle turbinated bone existed, and besides breaking up a few synechial bands, which existed between the turbinals and the septum, nothing was done. The pain persisted in the left side of the temple and evidently was due to some other cause than to the condition of the interior of the nose.

Remarks.—This case is of more than usual interest. First, from the almost inextricable union of symptoms of neurotic and local character. It is easy for a person of hysterical temperament to persist in the complaint of catarrhal trouble. In the absence of the discharge and of the usual means of making satisfactory physical examination, it becomes difficult and sometimes impossible to make a diagnosis. It is also a difficult matter to get a satisfactory history; but in this case the shape of the roof of the mouth, the intractable irritability of the pharynx, the well-defined history of the periodical attacks of excitement, convinced me that indications of disease were present somewhere within the nasal chamber.

Secondly, that the anterior end of one or both middle turbinated bones may be in a state of chronic degeneration with no external visible signs of the presence of the diseased tissue.

Thirdly, that our means of determining the unilateral location of chronic diseased action in the nose is vastly increased by making digital examinations.

Of the four cases just outlined (Nos. 5, 6, 7, 8), three belong

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to a group of subjects who, in connection with hay-fever attacks, have general impairment of nutrition. I have never seen this phase of disease earlier than middle life. Among these patients one was 40 years of age; a second, 35; a third, 56; a fourth, 52.[1] In all of these cases the conditions had existed for many years. A gouty disposition was inherited in two. Delicate digestion was present, and in one, inherited dyspepsia. In two, a neurotic element was very highly developed and exhibited peculiarities which I think have warranted separate descriptions. (Cases VI and VII.)

When the gouty element is predominant, the cause of the nasal complications being detected, the cure results when this exciting cause is removed; but if, as a result of a rheumatic or gouty inheritance, this escapes detection, or when found, cannot from its nature be removed, the hay-fever state will then continue in spite of all local treatment.

Permit me at this place to make a few remarks on the general subject of hay fever. In two cases of children, one 6 years of age the other not ascertained, the symptoms of hay fever entirely disappeared after the removal of the ordinary pharyngeal adenoid growth. No treatment in either of these patients had been directed to the nasal chambers, and it appeared to be a reasonable conclusion that the morbid condition was dependent upon the adenoid mass.

It is noteworthy that the most unfavorable subjects—that is to say, those in whom the least has been accomplished by treatment—are vigorous young adults. I have had an opportunity to study such a case in the person of a farmer whose surroundings were of the best; the general health was good; the initial attack was abruptly announced after a coryza. The most careful examination did not show a condition, either of the pharynx or nasal chambers, which suggested a cause for hay fever, nor was treatment followed by any degree of success worth mentioning.

A second case, a merchant of Washington, D. C., exhibited almost identical conditions. A long treatment produced an amelioration after the first season, but the disease returned in subsequent years.

In another case, a young lady who was relieved of the irritative states between the typical attacks, did not escape the exacerbation incident to the heat of summer. To this group, as represented in the last three cases, the description of older writers accurately applies.

Hay fever appears to be a complex condition which results from many exciting causes. It is already seen that the condition may be a reflex from different irritations. The following case is an example of

[1] This statement is made advisedly, for general writers assure us that hay-fever is apt to lessen in severity after middle age.

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its nature, being evidently due to impaired nasal respiration or to mechanical states as the result of pressure.

A professional gentleman who had suffered for a number of years with a disposition to headaches, during the heated term, also suffered from the symptoms of coryza and lachrymation, at other times of the year, found himself getting gradually worse, and reported to see whether something could not be suggested for his relief.

I found the left nasal chamber the narrower of the two and the vomerine spur projecting into the left lower turbinal. I suggested that this be removed. This was done under ether in the manner which I have proposed, and the patient has since had no return of these hay-fever distresses. This appeared to be in every way a typical case, and an illustration of the manner in which a reflex inflammatory excitement can be maintained by mechanical causes.

In another case there existed, only on the right side of the nasal chamber, hyperplasia of the anterior end of the middle turbinated bone with hypertrophy of the posterior end of the inferior turbinals. The patient, a lady in middle life, who had lost her husband after a lingering illness, found herself, after the strain attending the nursing and the shock of her husband's death, suffering from great distress in the nasal chamber. Being ordered away from her home, by her family physician, to a rural country seat, she found her troubles in no way corrected, and was finally induced to spend the remainder of the summer in the White Mountains. Upon her return, in the fall, she placed herself under my care. I found the right nasal passage to be the narrower of the two, the septum being well deflected to the right. The posterior end of the turbinal was large; the anterior end small.

The treatment consisted in reducing the size of the infiltrated structure of the anterior part of the middle turbinated bone, and in checking the disposition to mechanical states of the posterior end of the inferior turbinal. Owing to the greatly depressed state of the general health of the patient, these treatments occupied the greater part of 1886–87. Towards the middle of March, 1887, she reported that her catarrhal condition was greatly improved, and she accepted it as an encouraging circumstance.

The patient went through the next summer without leaving her home, with a greatly diminished form of her hay-fever attack. The following summer she escaped entirely without any manifestations of the attack, nor, indeed, did it return at any subsequent period, and she remained entirely free of the distress until the time of her death, which occurred three years later.

In two cases, both of them women, who were suffering from progressive deafness, so-called dry aural catarrh, one of them a woman of

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22 and the other a woman of 40, the treatment was less successful. I could not help associating this want of success with the fact that no genuine exciting cause could be detected. In one, the case of the younger woman, a disposition to secretion at the roof of the pharynx existed. The treatment, while improving the general health of both these subjects and for a time having a good impression on the hay-fever attacks, has not been entirely successful in removing them, nor has any impression been made upon the deafness.

[TO BE CONCLUDED.]

DOUBLE HEMIPLEGIA WITH DOUBLE HEMIANOPSIA AND LOSS OF GEOGRAPHICAL CENTRE.[1]

By Thomas D. Dunn, M.D.,

Physician to Chester County Hospital, West Chester, Pa.

The case which especially attracted my attention to the subject treated in this paper is a man of 68 years, married, who has led an active life. His parents lived to be nearly 70 years old. Four of five older brothers and sisters, and three of his four children are living and healthy. He is not addicted to the use of alcoholic drinks, and there is no history of syphilis. He fancied a good horse, and rode and drove much.

In 1888 he was thrown from his carriage and received several severe scalp wounds, but no fracture. He was unconscious for several hours. From this accident he completely recovered, although he was very nervous for several months.

During the winter of 1890, while in Philadelphia, he had an attack of epidemic influenza, followed by pneumonia, and was then under the care of Dr. H. C. Wood. With the exception of the above, he had had no severe illness, though he frequently applied to me for attacks of acute indigestion, which always brought on violent cardiac palpitation. The pulse would become intermittent, irregular, and often 130 per minute. These attacks seldom lasted more than two days, and during the intervals the heart's action was fair. He had no dyspnea, though there was mitral valvular disease with compensatory hypertrophy and general arterial hardening.

On the morning of May 2, 1891, he came to my office with one of these attacks. Being more comfortable in a few hours, he took a drive of eight miles to dine with a country friend. He ate a hearty dinner, and shortly afterwards became unconscious.

[1] Read before the College of Physicians of Philadelphia, March 6, 1895.

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At 8 P.M., two hours after the attack, I found there was partial paralysis of the right leg, nearly complete paralysis of the right arm, slight drawing of face, and partial right hemianesthesia. He was unable to articulate any words except "yes" and "no." Cold applications to the head and a calomel purge were prescribed.

The following day the movements of both arm and leg were improved, but he complained bitterly of pain in the head and eyes. Much relief was obtained from bromide and cups to the back of the neck.

On the third day right lateral homonymous hemianopsia was discovered, which doubtlessly dated from the beginning of the attack. He recognized persons and objects, but could not name them; movement of the right side was much improved, and he complained less of numbness.

At the end of ten days the hemiplegia had nearly disappeared, the facial expression was normal, and the hemianesthesia scarcely perceptible; knee-jerk increased. His mind was clear and there was considerable increase in his vocabulary, but no improvement in the field of vision.

In three weeks he was walking about as usual, and his general condition was as good as before the attack. Vision remained unchanged, and there was a slight tendency to bear to the left in walking. The aphasia slowly improved, though much trouble was found in recalling the names of things. With the exception of an occasional attack of indigestion he enjoyed good health, and drove and rode as usual, though his use of names was never entirely restored, and there was no increase in the visual field.

Dr. G. E. de Schweinitz examined the patient's eyes November 24, 1891, and supplied the following report:

Vision of the right eye $\frac{20}{40}$, of the left eye $\frac{20}{30}$. With $+3$ D, 0.50 m. was read with each eye at thirty centimetres. The excursion of the eyes was good in all directions; there was no paresis of any of the external ocular muscle, no history of diplopia, and only slight insufficiency of the internal recti muscles with the ordinary tests.

Ophthalmoscope.—Right eye.—An irregularly oval optic disk, gray in its deeper layers, and bounded by a pigment crescent at the outer side; veins full and tortuous, arteries normal; general fundus in good condition and without signs of former disease.

Left eye.—Irregularly oval, slightly gray, optic disk, edges a trifle prominent but clearly outlined; veins full, arteries normal; no abnormality in the retina or choroid.

Field of Vision.—Typical right lateral hemianopsia with contrac-

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tion of the preserved fields, the relatively smaller half field being upon the right side. The dividing line between the preserved and the darkened fields passed, as is usual, slightly in advance of the fixing points. (Figs. 1 and 2). Central color perception was normal.

Pupils.—Contraction of the iris to light was present equally when the beam was thrown upon the blind and upon the seeing side of each retina. In other words, the hemianopic pupillary inaction was wanting, consequently the lesion which determined the hemianopsia was situated posterior to the primary optic centres. The pupils were round, equal in size, and the iris reactions normal in all other respects.

January 28, 1893, after eating imprudently, he had an attack of indigestion with the usual cardiac disturbance, and awakened the follow-

FIG. 1.

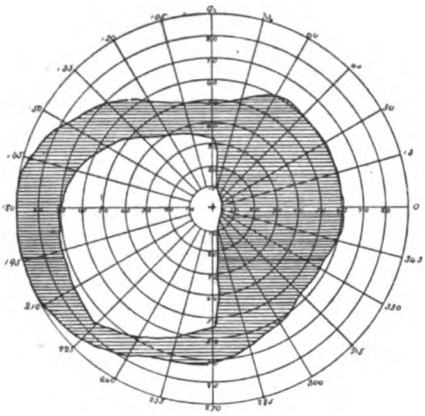
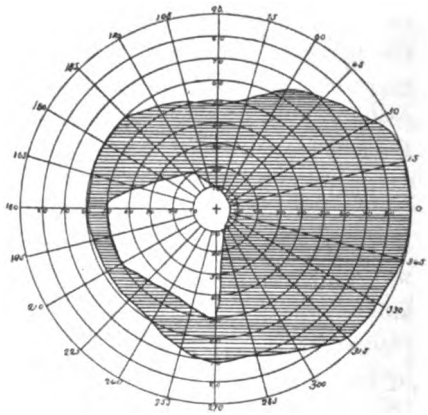


FIG. 2.



The external continuous line marks the boundary of the normal visual field, the internal continuous line the limits of the field in the case examined, the white area the region of preserved vision, the shaded area where vision was lost.

ing morning with left hemiplegia and partial hemianesthesia, associated with absolute blindness. Speech was not affected, but he was much worried over the loss of power in the left side and loss of sight, and he had no conception of where he was. Taste and smell were natural, voices were recognized, and his mind was only slightly affected.

Four days afterwards, as after the first attack, there was rapid restoration of power and sensibility, but no improvement in vision or knowledge of locality. His mind was clear, and he would discuss his condition intelligently.

On the eighth day he recognized light from a window, and when a candle was placed directly in front of him he saw it with each eye, but nothing could be distinguished in the room, and he could not

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recognize individuals except by their voices. He had much trouble in locating himself and his house,—being unable to form a mental picture of any place.

At the end of four weeks power and sensibility were restored, and he could walk, when led, as well as any blind man.

With his reading glasses letters could be recognized at his usual reading distance, but only the smallest words could be seen without changing the position of his head. Of the word "constantly," in ordinary reading type, he could see six letters, but not the remaining four. He could, however, read slowly by taking in small words and parts of large ones. There was no improvement in the sense of locality. He could form no conception of the geography of his own house or of any place he had ever been. He could recollect that he lived on the corner of two streets and their names, but their relation to each other, or to other streets, was completely lost. He could not see enough of the sketches made of the floors of his own house to assist him in getting an idea of the relation of things. When a place was named he could remember it, but its location or relation to other places was lost. He could recollect individuals by their voices, and could describe correctly their appearance.

Dr. de Schweinitz examined the patient's eyes again April 19, 1893, when the following conditions were noted:

Vision of the right eye equalled one-half, that of the left also one-half of normal. With + 3 D ordinary newspaper print (pica and small pica) could be read very slowly, one word at a time, by holding the head in such position that the word corresponded exactly with the point of fixation. If the word was long, only a portion of it could be read at a time.

Ophthalmoscope.—The appearances of the optic nerve, blood-vessels, and general fundus of each eye were the same as those noted in the previous examination, save only that the grayness in the deeper layers of the disks was more manifest, and there was slight blurring of the nasal edges of the nerve-heads.

Field of Vision.—The visual field in each eye was obliterated, with the exception of a small, irregularly oval patch directly in its centre, about ten degrees in the horizontal and slightly greater in the vertical diameter. In other words, there had been added to the previous condition a left lateral hemianopsia. The preservation of this small central field in each eye indicated that the region in the cortical visual centres which supplies the macula lutea had not been destroyed,—another clinical demonstration of the special representation of the macula lutea in the cortex. (Figs. 3 and 4.)

Pupils.—The iris reaction, when a beam of light was directed into

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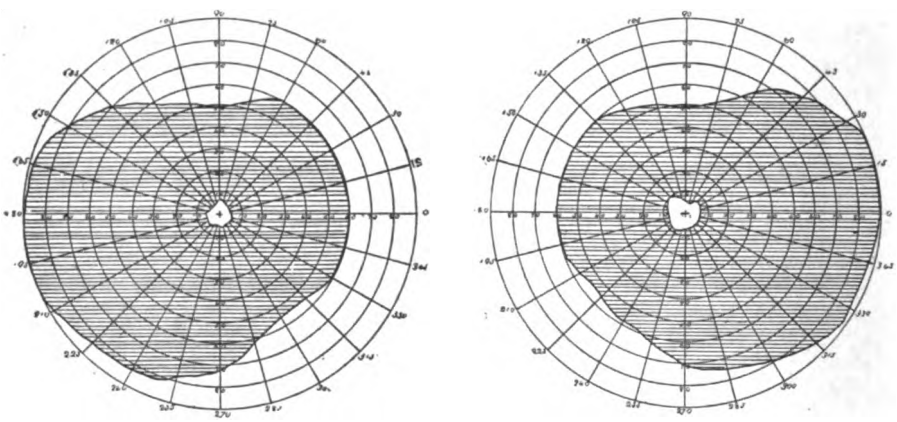
the pupillary space so as to fall, if possible, on the macular region, was normal in each eye, although the response was less prompt or almost absent when the beam was thrown to either side of this position.

Color-sense.—This was practically lost; red gave the sensation of "brass," green that of "gray-white," yellow was called "gold but not bright enough," and blue was described as a color that "might be purple."

In January, 1895, he had another attack of pneumonia, not extensive, from which he recovered, but with weakened heart action and considerable dyspnea.

It is now (March 1, 1895) over two years since the second attack of hemiplegia. There is no perceptible improvement in the field of vision; there is a small central point which can recognize a pin on the

FIG. 3. FIG. 4.



Diagrams of the visual fields after the second attack of hemianopsia. The small central white area represents the limits of the preserved field (macular vision); the shading where vision was lost.

floor, but he can see only short words at ordinary reading distance. Although he has driven over the town and walked about with an attendant almost daily, nothing has been gained of the lost sense of locality. Two points show slight improvement in this respect in his own home.

After coming from a walk, if he is led to the front door and stands face inward, he can walk to a smoking-room at the opposite end of the thirty-foot hall; if, however, his face is turned outward, or even a quarter around, he cannot find his way. In his sitting-room, he fixes his position by the tick of the clock and can find his way out of one door to a bath-room, or out of another to the hall, where the banister enables him to descend the stairs to the dining-room. The aphasia

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has nearly disappeared, though some words are still recalled with difficulty.

His general condition is fair, and he discusses his case with much interest and intelligence.

This case presents many points of unusual clinical interest to the ophthalmologist, neurologist, and general practitioner. Double hemiplegia with double hemianopsia is rare, and a single instance deserves a careful record. The reported cases of double hemianopsia will be briefly referred to, and thanks are due to Dr. de Schweinitz for his assistance in obtaining references.

Förster's[1] patient had a right hemianopsia, which, with the exception of a slight headache, began without cerebral symptoms. The line of division was not perpendicular, and defects were noticed both above and below the horizontal line and in the region of the macula. At first vision was one-third normal, soon it became normal, and afterwards there was total blindness. Still later a small central field was restored with one-third vision. Color-sense was lost.

The loss of recollection of locality was also a prominent feature of this case. The patient, after remaining a long time in his room, could not tell where anything was, and could not move about as well as a blind person. No positive improvement in this respect was recorded.

Schweigger's[2] case developed a sudden left hemiopic defect in September, 1888, without loss of consciousness or hemiparesis. Central vision was unchanged. In August, 1889, the right visual field failed as suddenly as the left had done before. A small central field was preserved. Unlike Förster's case, his memory and sense of locality were undisturbed.

Groenouw[3] observed left hemiplegia in a man in January, who had left homonymous hemianopsia the following April. Ten months later, after an attack of apoplexy, there was a remarkable loss in orientation. Field of vision was very narrow in all directions, but central vision about normal. A month later there was improvement in vision, but total loss in right inferior quadrants. Color-sense not destroyed centrally. The loss in sense of locality was accounted for by the loss of recollection of optical images.

Vorster[4] has described a case of apoplexy in a man who had had an attack four years previously with loss of sensibility of right half of body, and indefinable sensations of loss of sight. He subsequently had a third stroke with loss of consciousness, left facial palsy and paralysis of left extremities and total loss of sight. Eight days afterwards there was a return of vision in right fields. Four weeks later he had hallucinations, and was unable to find his way about in familiar places. The left half of field was totally lost and right contracted.

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Four months later, vision in right was one-third; left, one-fourth; color-sense restored. Both halves defective, with the exception of central zone about fixation point.

Gaffron[5] reports a patient, aged 14 years, who received a fracture of the skull in December, 1890, and was seen by him January 10, 1891. The fracture began six and a half centimetres above the right mastoid, five centimetres behind the ear, and extended two centimetres to the left of the median line, four centimetres above the occipital prominence. Vision was nearly lost at first, but later it improved so that the patient could go about. A small, central, visual field was restored, which enabled her to read small words on a large white surface.

The pupillary reaction was normal. No mention is made of loss of sense of locality. Gaffron accounted for the symptoms by the theory of a cortical lesion from the pressure of a hematoma involving the cortical visual area in the occipital lobes of both sides.

Hoche[6] (quoted by Kneis[7]) reports a very interesting case of double hemianopsia, inferior, in which there were hallucinations in the seeing field of vision, and similar phenomena in the blind. The case was only clinically observed, but the lesion was referred to the occipital lobes.

Edinger[8] (also referred to by Kneis) relates a case that was considered one of double softening of the occipital lobes. Suddenly there appeared a bright flash followed by complete blindness. This was thought to be a half blindness, the result of embolism, hemorrhage, etc., occurring alternately on both sides or at the same time.

Schmidt-Rimpler's[9] case was a man of 51 years who received a scalp wound in 1873. The right homonymous hemianopsia in this case was preceded by headache and paresis of the right extremities, with clonic spasms. A year later a contraction of the field was observed, followed by sudden total blindness. A small central field was subsequently restored, but later it was reduced to a minimum. No loss of the sense of location was noticed.

The autopsy showed that the right hemianopsia was due to a hematoma of the dura mater. The right paresis was the result of the extensive cicatricial contraction in the posterior central convolution.

The later loss of left visual field he ascribes to a cheesy focus in the region between the gray and white substances in the posterior portion of the right posterior lobe.

Swanzy[10] and Werner's case was first seen several months after an attack of apoplexy. He had paralysis of left arm and right-side hemianopsia. The fundus was normal, but vision was confined in each eye to the left upper quadrant, the other quadrants being wanting. No record was made of loss of orientation.

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Magnus[11] reports the case of a man, aged 52 years, who thirteen years before had a sudden attack of left hemiparesis and left homonymous hemianopsia. Ten years after first attack the second appeared, in which there was loss of consciousness, but no paresis. Three years after the second attack he had a third without paralysis, but there was complete blindness. After a few days he could see small objects, and when the presbyopia was corrected the small central field could recognize No. III Snellen's test-types. He was unable to find anything in his room, and loss of memory of recent events was noticed. There was no further improvement in vision in thirteen weeks after the attack. Color-sense was normal. Nineteen weeks later there was no gain in sense of locality.

Förster[1] explains the preservation of the small central field in these cases on the hypothesis that the small portion of the occipital lobe which serves for the most acute perception, the direct vision, is supplied by the anastomosis of two or more vessels. If the main vessel which nourishes the cortex of the occipital lobe is thrombosed, and the cortex is cut off from its blood-supply, the region of most acute vision might receive its blood-supply from the second vessel. He also offers this hypothesis as an explanation of the frequent deviation, in hemianopsia, of the line of demarcation towards the defective side.

The cases of bilateral hemianopsia that were at first totally blind and in which central vision was subsequently restored, such as the Schmidt-Rimpler,[9] Vorster,[4] Gaffron,[5] and the one herein related, support the view that the macular region has a bilateral vascular supply. This view is supported by the cases with autopsies reported by Wilbrand.[12] The physiological importance of this region, the anatomical size of the macular nerve-fibre, as well as all the reported cases, are considered by Schmidt-Rimpler as supporting Förster's theory that the macular cortical region has a double vascular supply and is capable of much resistance.

In nearly all the recorded cases the absence of the hemiopic pupillary reaction was noted, which places the lesion beyond the reflex curve, either in the optic radiations or the cortical visual area.

In the absence of positive information as to the position of the lesion, much speculation might be indulged in as to the cause of all the symptoms of my patient. Only brief reference, however, will be made to a few points. In the attack of 1891, in addition to the cortical lesion causing the right hemianopsia, it must have involved the posterior portion of the internal capsule to account for the aphasia and transient right hemianesthesia and paresis. It is not probable that a double lesion existed in the first attack, for the second attack, in 1893, was identical with the first, the only difference being that the left side was affected, and, instead of aphasia, there was loss of the sense of locality.

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An embolus was probably the cause of each attack, a clot having been whipped off the roughened valve during the heart-disturbance attending the attack of acute indigestion.

It seems that the loss of sense of locality is an important, if not a characteristic symptom of double hemianopsia. It was present in the cases reported by Förster, Groenouw, Vorster, Magnus, and myself. Schweigger did not observe this symptom, but the hemiopic defect in his patient was incomplete.

The loss of sense of locality was not recorded in the Schmidt-Rimpler case, but he confused right and left and his memory was poor. No reference is made to the loss of locality in Swanzy's case, but a quadrant in each field was partially preserved. No mention is made of this symptom by Kneis in his brief references to Hoche and Edinger, and it was not observed in Gaffron's patient.

Groenouw ascribes the loss of the sense of locality in double hemianopsia to the loss of recollection of optical images, which seems at least a plausible explanation. My patient, however, could recollect persons and could describe correctly their appearances. This would suggest a different place in the brain for the record of such images. The loss in my patient accompanied the second attack in 1893, when the left hemianopsia was accompanied by the left transient hemiparesis and anesthesia. This suggests a centre (which may, for convenience, be named the geographical centre) on the right side of the brain for the record of the optical images of locality, analogous to the region of Broca for that of speech on the left side in right-handed persons.

Nearly four years have passed since the first attack of motor aphasia, transient right hemiplegia, and right hemianopsia. The hemianopsia has not improved, but the power of articulate speech has been nearly restored, as is usually the case with aphasia.

Over two years have passed since the second attack, and there has been practically no improvement in the sense of locality, except that which has been gained through the sense of hearing,—for example, the tick of the clock in the sitting-room fixing the position of two doors.

In the case of his aphasia, restoration of the power of speech would come largely from the perceptions received through the senses of sight and hearing.

His central field of vision is so limited that there is no opportunity, from the small optical images received, to conceive the relation objects bear to each other. In the absence of better reasons, this may be offered as an explanation of so little improvement in this symptom.

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[6] *Hoche:* Arch. für Psych., XXIII.
[7] *Kneis:* Die Beziehungen des Sehorgans und seiner Erkrank., pp. 62 and 63.
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[11] *Magnus:* Deutsche med. Wochenschrift, January 25, 1894.
[12] *Wilbrand:* Die Hemianopschien Gesichtsfeld-Formen, 1890, p. 109.

THE TREATMENT OF DIPHTHERIA BY ANTITOXIN SERUM, WITH REPORT OF TWENTY-FIVE CASES.[1]

BY ALEXANDER MCALISTER, M.D.,

Camden, N. J.

THE method of preventing and curing diphtheria by antitoxin serum continues to attract the attention of the medical world. Now that the first moments of excitement caused by this marvellous discovery have passed by, scientific medical men are devoting themselves to a calmer and more practical examination of the subject. It has been regarded by some as a mere experiment, but it has passed that stage. In the treatment of diphtheria it is as valuable an agent as vaccine is in the prevention of small-pox; no one will doubt this after having read the remarkable results obtained by Professor E. M. Roux, of Paris, in the treatment of his cases of diphtheria during the last three years, reported by him in September, 1894, at the Eighth Session of the International Congress of Hygiene and Demography, held in Budapesth. The principle of the method has opened a new field for work in infectious diseases. At a recent meeting of the Berlin Medical Society, Dr. Hansemann read a paper condemning serum therapy; in the discussion which took place after the reading of Dr. Hansemann's paper, Professor Virchow stated that he was quite in accord with the views of his assistant, Dr. Hansemann, in denying any specific value to the Klebs-Löffler bacillus in the causation of diphtheria. He acknowledged, however, that the statistics, so far produced, were very favorable to

[1] Read before the District Medical Society of the County of Camden, February 12, 1895.

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the curative power of the antitoxin serum. For instance, from about the 15th of March last, Behring's serum had been injected into 303 out of 533 children admitted to the Frederick Hospital for Diphtheria; in the 303 injected children the mortality was 13.5 per cent.; in the 230 who did not receive serum, the mortality was 47.82 per cent. Professor Virchow concluded that Behring's serum is really efficacious, and that every physician ought to use it in spite of certain drawbacks with which it is charged.

Drs. Von Bergmann and Holff supported the specific character of the Klebs-Löffler bacillus in the causation of diphtheria. The former had tried serum in several cases, but had not yet sufficient data to form a definite opinion. In tracheotomy for all causes, an operation which he had done 2586 times, his mortality had been 52 per cent. Dr. Korte remarked that the results obtained by serum therapy are much superior to those obtained by the ordinary means of treating diphtheria; out of thirty-six patients treated for diphtheria he had lost nine, and three of these were moribund when brought to the hospital. Of the thirty-six, eight only were light cases. With regard to the albuminuria, resulting from the serum, Dr. Korte admits the soundness of the charge, but he does not consider that a sufficient reason for giving up a treatment which has produced results altogether remarkable in a very serious disease.

The last meeting of the Medical Society of Greifswald, in Germany, was entirely taken up with the consideration of serum therapy in diphtheria. Dr. Borger gave the results of his treatment of thirty patients who had diphtheria, five of whom had been tracheotomized; he had two deaths, or a mortality of about 7 per cent. In former years, with other plans of treatment, the mean mortality was 14.5 per cent. With regard to the effect of the injections, Dr. Borger noted the improvement of the local conditions in from twelve to twenty-four hours, with lowering of the temperature in from two to four days; albuminuria was pretty frequent, but transient. Dr. Beumer cited two facts in favor of the prophylactic value of the serum. In a family in which five children were attacked with diphtheria, the sixth was treated with serum; he did not take the disease, though continually in contact with his sick brothers. In a boarding-school, three pupils caught diphtheria, fourteen others were treated with serum, and did not contract the disease.

Dr. Polienctoff reported to the Society of Pediatrics of Moscow that he had treated nine cases of diphtheria, two with Aronson's serum and seven with that of Dr. Roux, and lost only one. Professor Filatoff added a tenth case treated successfully by himself. In England, Dr. Campbell White[1] gives a report of twenty cases, of which fourteen had

[1] Medical Recorder, November 17, 1894.

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croup, requiring tracheotomy in five cases. Aronson's serum was used. The mortality was 25 per cent.; four deaths in fourteen cases of croup, one death in six uncomplicated cases. Among the isolated cases reported in the *British Medical Journal*, we notice three cases by Dr. Simpson, with two deaths; one case of cure by Dr. Lees; one case of cure by Dr. Christie, and also one successful case by Dr. Phillips.

At a meeting (December 14) of the London Clinical Society, Dr. Washbourne read a paper showing that out of seventy-two cases of undoubted diphtheria treated by him with serum, fourteen died, showing a mortality of 19.44 per cent. Of nine tracheotomized cases three died; six cases only showed postdiphtheritic paralyses, no instance of which was of a serious character. Dr. Herringham had used serum in eighteen cases of diphtheria, in children ranging from 20 months to 2½ years of age, seven were light cases and eleven were serious; all the light cases recovered; in the serious cases tracheotomy was required in ten and intubation in one; seven recovered, which is rather a favorable showing when we recollect the serious character of tracheotomy in nurslings.

Dr. Lennox Brown had used serum in five cases; two children died with symptoms of anuria; in one of the other cases a well-marked oliguria was observed.

A statistical report, compiled by Dr. Peyron, was sent last December to the "Comité Consultatif d'Hygiene" of France, in which he shows the comparative figures of the results obtained before and since the new treatment was begun at the Sick Children's Hospital and the Trousseau Hospital, Paris.

The following table shows the results obtained from the years 1887 to 1893:

DIPHTHERIA.	1887.	1888.	1889.	1890.	1891.	1892.	1893.
Cases:							
Sick Children's Hospital . .	802	874	873	1002	957	997	1015
Trousseau Hospital	775	909	1055	1105	946	1073	862
	1577	1783	1928	2107	1903	2070	1877
Deaths:							
Sick Children's Hospital . .	508	601	569	560	502	475	492
Trousseau Hospital	451	552	615	648	519	563	471
	959	1153	1184	1208	1021	1038	963
Mortality, per cent.:							
Sick Children's Hospital . .	63.34	68.76	65.18	55.81	52.45	47.64	48.47
Trousseau Hospital	58.19	60.72	58.28	58.64	54.86	52.47	54.63
Average	60.81	64.66	61.41	57.33	53.65	50.14	51.30

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The second table shows the results of the new treatment, which was inaugurated February 1, 1894, at the Sick Children's Hospital, and on September 18 at the Trousseau Hospital; results considered at first separately in each of these hospitals, and afterwards in both taken together:

DIPHTHERIA.	Cases.	Deaths.	Mortality. Per Cent.
Sick Children's Hospital	780	164	21.00
Trousseau Hospital	247	39	15.02
Sick Children's Hospital and Trousseau Hospital taken together	1027	203	19.76

Early on Wednesday morning of January 2, 1895, the matron of the West Jersey Orphanage called at my office and informed me that five of the children were complaining of sore throat; on my arrival at the Orphanage I examined the children and found them suffering from diphtheria; adjoining the Orphanage, about twenty-five feet distant, there is a frame building one story high used for a school-house. I had this building cleared of desks, etc., and thoroughly cleaned, had beds placed in it, and isolated the five cases, and the following day, January 3, seven other cases developed, January 4, four cases, January 5, one case, and January 7, two cases. Having read of the success of antitoxin in diphtheria I decided to use it, after being granted permission by the managers. I called upon Dr. William M. Welch, at the Municipal Hospital, in Philadelphia, to find out where I could obtain antitoxin; he said he did not think I could get the German serum in this country, as the Philadelphia Board of Health had sent to Germany over two months ago and had received no reply; I then despaired of getting it. Dr. Welch referred me to a Philadelphia druggist, whom he said had some that was manufactured at the Pasteur Institute in New York. Dr. Welch said he had only used the German serum and knew very little about the American; he stated, also, that he had at this time used it in seventeen cases, with one death; he spoke very conservatively about the use of it. I gave the Philadelphia druggist an order for five bottles; the following morning a manager of the Orphanage, Mr. B. C. Reeve, went to New York, but succeeded in getting only two bottles; he arrived home very late that evening; I was absent from home when he returned, and did not use these two bottles of serum until early Friday morning.

One of the first five cases, L. S., aged 10 years, had laryngeal diphtheria, and died January 3, in thirty-two hours after I first visited

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him. He was the first child that complained of sore throat, and was given ferri bichloridum, strychnine, liquid diet, and stimulants internally, locally 50-per-cent. solution of lime and sulphur; his death occurred the day before I received the antitoxin, and he was the only child that died during the epidemic; all the other children received the injection. Judging from the malignancy of this case, I was well aware that prompt and energetic measures were necessary to stamp out this epidemic. I gave each child twenty-five cubic centimetres as soon as the disease was apparent. On Friday afternoon I received the other five bottles, which were injected at once; on Saturday I received one dozen bottles, and then injected all the children. On Sunday six more bottles were telegraphed for, to be used for re-injecting; this was necessary in only two cases,—in one case that had been immunized, J. S., and in one of the laryngeal cases, E. McC. I injected the cases of greatest severity first.

CASE I.—J. S., male, aged 11 years, colored, was taken sick January 2. At 11 A.M., January 4, injection of twenty-five cubic centimetres of antitoxin serum (Dr. Roux's formula), prepared in New York. At the time of injection the patient had a well-developed case of laryngeal diphtheria,—hoarseness, croupy cough, laryngeal stenosis, difficult swallowing; child restless and anxious, dyspnea, lymph-glands enlarged, purulent discharge from nose and mouth; tonsils, uvula, and pharynx heavily covered with membrane. Pulse 100, weak and thready; temperature 100° F.; respiration 26, noisy, resembling snoring. In twenty-four hours after the injection the false membrane began to lose its grayish appearance and became whiter; it soon became detached, and a simple irrigation caused it to be expelled, and it did not reappear. The lymph-glands underwent a simultaneous improvement; at the end of a week one could scarcely tell that they had been enlarged. On January 12, erythema, with some irritation of skin, which lasted about three days. Examination of urine, January 8, showed no albumin; January 11, trace; January 15, 2 per cent.; January 25, trace; February 5, none. Discharged, cured, February 5.

CASE II.—E. McC., female, aged 3 years, taken sick January 2. Laryngeal diphtheria. Injection of antitoxin serum January 4, 6 P.M., twenty-five cubic centimetres. Well-developed case,—croupy cough, entire loss of voice, enlarged lymph-glands, swallowing difficult, membrane abundant on roof of mouth, soft palate and pharynx, and in nares. January 5, 9 P.M., chill. On January 7 a large piece of membrane came from nares, almost a complete cast. This child did not show as much improvement as the former case. On January 8, at 11.30 A.M., I gave her ten cubic centimetres more of antitoxin; the improvement in her case was noticeable in about twenty-four hours.

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Pulse in beginning was 124, at time of second injection 140, very weak; respiration 28; temperature 102° F. Erythema January 10. Membrane had entirely disappeared by eighth day. Examination of urine, January 8, showed 2 per cent. albumin; January 11, 2 per cent.; January 18, trace; January 25, none. Sequela, paralysis of soft palate. Discharged cured.

CASE III.—J. W., male, aged 9 years, taken sick, January 2, with faucial diphtheria. Injection of antitoxin serum January 4, 6 P.M., twenty-five cubic centimetres. Redness of soft palate; swollen tonsils; inner surface of same and arch of palate covered with grayish-white membrane; enlarged lymph-glands; croupy cough. Pulse 110; temperature 103$\frac{2}{5}$° F.; respiration 44 at time of injection. Patient began to improve in about twenty-four hours; membrane disappeared in about five days. Erythema January 20. Examination of urine, January 8, gave no albumin; January 11, none; January 15, trace; January 25, none. Sequela, paralysis of lower limbs; gait uncertain and tottering, patellar reflex gone; no loss of sensation. Still under treatment for paralysis; general condition good.

CASE IV.—D. S., male, aged 3 years, taken sick, January 2, with faucial diphtheria. Injection of antitoxin serum January 4, 5.50 P.M., twenty-five cubic centimetres. Soft palate and fauces covered with membrane; tonsils swollen; lymph-glands enlarged; voice husky. Began to improve in twelve hours; membrane disappeared in four days. At time of injection pulse 108; temperature 100° F.; respiration 24. Erythema January 14. Examination of urine, January 8, showed no albumin; January 11, trace; January 15, trace; January 25, none. Sequela, abscess of middle ear. Discharged, cured, February 8.

CASE V.—C. M., male, aged 10 years, taken sick, January 3, with faucial diphtheria. Injection of antitoxin serum January 5, 10.20 P.M., twenty-five cubic centimetres. Membrane on tonsils and in fauces; slight enlargement of glands; croupy cough; nasal inflammation; purulent discharge. Improvement in twelve hours; membrane disappeared in five days. At time of injection pulse 96; temperature 98$\frac{4}{5}$° F.; respiration 28. No erythema noticed in this case. On examination of urine, January 8, 11, 15, and 25, no albumin was found.

CASE VI.—H. B., male, aged ten years, taken sick, January 3, with laryngeal diphtheria. Injection of antitoxin serum January 4, at 11.15 A.M., twenty-five cubic centimetres. Patient well-nourished; swallowing difficult; lymph-glands enlarged; dyspnea; purulent discharge from nose and mouth; membrane abundant on tonsils, uvula, and pharynx. Pulse 130, weak; temperature 102° F.; respiration 28, croupy sound on coughing, marked hoarseness; membrane disappeared in five days.

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Urine examined January 8, 11, 15, and 25, trace of albumin; February 5, none. Sequela, paralysis of soft palate. February 5, discharged well.

CASE VII.—L. F., male, aged 9 years, taken sick, January 3, with laryngeal diphtheria. Injection of antitoxin serum January 5, 10 P.M., twenty-five cubic centimetres. At time of injection temperature 101⅔° F.; pulse 110; respiration 26. There was marked laryngeal symptoms; stridor; hoarse, croupy breathing; croupy sound on coughing; membrane on tonsils, uvula, pharynx and soft palate; lymph-glands enlarged; voice husky; nasal inflammation with purulent discharge. Beginning laryngeal stenosis. Improvement noticed in forty-eight hours; membrane disappeared in five days. Examination of urine, January 8; found a trace of albumin; January 11, none; January 15, trace; January 25, none. Sequela, paralysis of soft palate; nasal tone. Discharged, cured, February 8.

CASE VIII.—J. B., male, aged 10 years, taken sick, January 3, with faucial diphtheria. Injection of antitoxin serum January 5, 10.25 P.M., twenty-five cubic centimetres. Small amount of membrane on tonsils and in fauces; hoarseness; slight enlargement of lymph-glands. At time of injection temperature 102⅘° F.; pulse 100; respiration 29. Examination of urine, January 8, 11, 15, and 25, no albumin. Erythema January 14. Improvement in twelve hours; membrane disappeared in three days. Discharged, cured, February 3.

CASE IX.—J. R., male, aged 9 years, taken sick, January 3, with laryngeal diphtheria. Injection of antitoxin serum January 4, 6.10 P.M., twenty-five cubic centimetres. Laryngeal huskiness; croupy cough; signs of beginning laryngeal stenosis. Pulse 120, weak; temperature 102⅜° F.; respiration 24. Very restless; soft palate; uvula, tonsils, and pharynx covered with a grayish membrane; nasal inflammation, with purulent discharge; lymph-glands enlarged. Improvement noticed in twenty-four hours; membrane disappeared in four days. Examination of urine, January 8 and 11, showed no albumin; January 15, trace; January 25, none. No erythema noticed; no sequela. Discharged, cured, February 1.

CASE X.—T. M., male, aged 10 years, taken sick, January 3, with faucial diphtheria. Injection of antitoxin serum January 5, 10.30 P.M., twenty-five cubic centimetres. Membrane on tonsils; small amount in fauces; croupy cough; some hoarseness; unilateral enlarged lymph-glands. At time of injection pulse 100; temperature 99° F.; respiration 24. Examination of urine, January 8, 15, and 25, showed no albumin; membrane disappeared in two days. No erythema; no sequela. Discharged, cured, January 24.

CASE XI.—E. E., male, aged 9 years, taken sick, January 3, with

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laryngeal diphtheria. Injection of antitoxin serum January 4, 6.15 P.M., twenty-five cubic centimetres. Membrane abundant on soft palate; tonsils, uvula, and pharynx grayish-white in color; lymph-glands enlarged; nasal inflammation and purulent discharge; superficial ulcers at edge of nostrils; hoarseness; croupy cough; child restless and anxious. Pulse 100; temperature 102⅖° F.; respiration 30. Improvement noticed in twenty-four hours; membrane disappeared in five days. Examination of urine, January 8, showed no albumin; January 11, trace; January 15, 2 per cent.; January 25, 1 per cent.; February 5, none. Erythema. Sequelæ, paralysis of the soft palate, which came on two weeks after, and of laryngeal muscles and esophagus; hypodermics of strychnine and rectal alimentation had to be resorted to in this case for three weeks. Child now convalescent.

CASE XII.—E. J., female, aged 7 years, taken sick on January 4 with faucial diphtheria. Injection of antitoxin serum January 5, 10.15 P.M., twenty-five cubic centimetres. Small amount of membrane on tonsils and in fauces; croupy cough; hoarseness; slight enlargement of lymph-glands. At time of injection pulse 112; temperature 99⅕° F.; respiration 30. Examination of urine, January 8, 11, 15, and 25, showed no albumin. Erythema absent.

CASE XIII.—C. M., male, aged 6 years, taken sick on January 4 with faucial diphtheria. Injection of antitoxin serum January 5, 10.40 P.M., twenty-five cubic centimetres. Small amount of membrane on tonsils and in fauces; voice husky; croupy cough; enlarged lymph-glands. At time of injection pulse 120; temperature 104° F.; respiration 28. Examination of urine, January 8, 11, 15, and 25, showed no albumin. Membrane disappeared in three days. No sequela. Discharged, cured, January 26.

CASE XIV.—M. B., female, aged 4 years, taken sick, January 4, with laryngeal diphtheria. Injection of antitoxin serum January 5, 10.05 P.M., twenty-five cubic centimetres. Croupy cough; laryngeal huskiness, and stenosis. Pulse 140, weak; temperature 100° F.; respiration 26. Child restless; soft palate; uvula, tonsils, and pharynx covered with grayish membrane; nasal inflammation with purulent discharge; lymph-glands enlarged. Improvement noticed in thirty-six hours; membrane disappeared in five days. Examination of urine, January 8 and 11, showed no albumin; January 15, trace; January 25, none. No erythema noticed. Sequela, small abscess at point of injection containing about one teaspoonful of pus incised; closed in a week. Discharged, cured, January 27.

CASE XV.—N. H., male, aged 3 years, taken sick, January 4, with faucial diphtheria. Injection of antitoxin serum January 5, 10.15 P.M., twenty-five cubic centimetres. Membrane on tonsils and in fauces;

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hoarseness; slight enlargement of lymph-glands. At time of injection pulse 98; temperature 98$\frac{4}{5}$° F.; respiration 24. Membrane disappeared in two days. Examination of urine, January 8, 11, 15, and 25, showed no albumin. Erythema January 7; no sequela. Discharged, cured, January 25.

CASE XVI.—E. R., male, aged 10 years, taken sick, January 5, with faucial diphtheria. Injection of antitoxin serum January 5, 10.20 P.M., twenty-five cubic centimetres. Small amount of membrane on tonsils and fauces; croupy cough; hoarseness; lymph-glands slightly enlarged. At time of injection pulse 100; temperature 99$\frac{3}{5}$° F.; respiration 24. Examination of urine, January 8, 11, 15, and 25, showed no albumin. Membrane disappeared in four days. No erythema; no sequela. Discharged, cured, January 26.

CASE XVII.—W. P., male, aged 10 years, taken sick, January 7, with faucial diphtheria. Injection of antitoxin serum January 7, 11.30 A.M., twenty-five cubic centimetres. Slight amount of membrane on tonsils and in fauces; hoarseness; croupy cough; enlarged lymph-glands. At time of injection pulse 108; temperature 99$\frac{3}{5}$° F.; respiration 26. Examination of urine, January 8, 11, 15, and 25, showed no albumin. Membrane disappeared in two days. Erythema January 17; no sequela. Discharged, cured, January 28.

CASE XVIII.—J. S., male, aged 11 years, taken sick, January 8, with laryngeal diphtheria. Injection of antitoxin serum January 7, 11 A.M., twelve and a half cubic centimetres; second injection January 11, 11.30 A.M., twenty-five cubic centimetres. Croupy cough; hoarseness; beginning stenosis. Pulse 120, weak; temperature 102° F.; respiration 26. Membrane on palate, tonsils, and in pharynx; some nasal discharge; lymph-glands enlarged; membrane disappeared in four days. Examination of urine, January 11, showed a trace of albumin; January 15, trace; January 25, none. No sequelæ. Discharged, cured, January 24.

One case of Dr. W. A. Kensinger, of North Cramer Hill, one of Dr. H. A. Wilson, of Woodbury, one of Dr. J. A. Stanton, of this city, and four cases in my own practice constitute this series.

CASE XIX.—Dr. W. A. Kensinger sent for me on January 17 to see Mrs. S., aged 35 years; laryngeal diphtheria. She was at this time suffering from the effects of an abortion and inflammatory rheumatism. Her soft palate, tonsils, and pharynx were covered with a grayish-white membrane. I advised an injection of antitoxin serum, which was given on January 17, at 8.30 P.M. Pulse 103; temperature 100$\frac{3}{5}$° F.; respiration 28. The doctor wrote me that he visited her the following morning; upon examining the throat he found the membrane whiter, and beginning to loosen around the edges. He again visited

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her the same evening, and found that a large portion of the membrane had disappeared. On the following afternoon no membrane could be seen; this was thirty-six hours after the serum was injected. I regarded the high temperature at the time of injection due to the abortion and inflammatory rheumatism. The urine contained albumin. She died seven days after the injection. This case being complicated with abortion and rheumatism was not a fair test-case of the antitoxin serum.

CASE XX.—Patient of Dr. H. A. Wilson's, of Woodbury, N. J. He was called to see E. W., aged 8 years; complaining of sore throat and headache. Upon examining the throat, he found both tonsils and fauces covered with a grayish-white adherent exudation; tongue coated; breath fetid. Pulse 120; temperature 101$\frac{2}{5}$° F.; respiration 28. Submaxillary and cervical glands enlarged and tender. From these symptoms, together with the fact that I had during the preceding month treated four cases of diphtheria in the same family, my diagnosis of laryngeal diphtheria was readily made, and I determined to try the antitoxin treatment. The doctor telephoned me in regard to this, and he requested me to come to Woodbury and administer the antitoxin, which was done at 6.15 P.M. At time of injection pulse 130; temperature 102$\frac{2}{5}$° F.; respiration 26. The membrane by this time had made its appearance on the uvula and posterior wall of the pharynx; no other treatment was employed except to swab the throat with sterilized solution of boracic acid. On the morning of the 20th, the temperature had fallen to 100$\frac{3}{5}$° F.; pulse 108; respiration 18; condition of throat unchanged. On the 21st I was surprised to see the patient sitting up, and said he felt well. Temperature 98$\frac{3}{5}$° F.; pulse 94; respiration 18. The membrane appeared thin, and showed in spots the mucous surface beneath; appetite good; bowels regular. January 22 membrane almost entirely gone; few small spots on tonsil. Temperature 97$\frac{3}{5}$° F.; pulse 76; respiration 22. January 23 condition of throat about same. Temperature 99$\frac{3}{5}$° F.; pulse 100; respiration 20. Erythema was present about point of injection. On the 24th there was a well-marked erythema all over the body. Temperature 100$\frac{2}{5}$° F.; pulse 96; respiration 21. January 25 temperature 98° F.; rash disappearing. Patient entirely recovered.

CASE XXI.—Patient of Dr. J. G. Stanton, of this city. Was called to see A. B., female, aged 11 years, January 26, 5 P.M., and found her suffering with laryngeal diphtheria. I at once began the regular treatment for same; next morning found her symptoms much aggravated. Pulse 120; temperature 102$\frac{3}{5}$° F.; respiration 36. I suggested the use of antitoxin serum, as I believed the patient would succumb to the disease on the regular treatment; the doctor asked me

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to meet him in consultation at 4.30 P.M.; and in the presence of Dr. Grier and myself the patient was injected with twenty-five cubic centimetres of antitoxin serum; three days after the injection the membrane came away, leaving the throat clear. On February 3, the eighth day after the injection, an erythema appeared; the patient did well until February 7; when I called on February 7 found her suffering with pain in the region of her heart. She died suddenly Friday, 2.15 A.M., of paralysis of the heart.

CASE XXII.—E. W., female, aged 25 years, called at my office January 10, complaining of sore throat. On examination I found membrane on tonsils and in fauces; diagnosis faucial diphtheria. I ordered her to bed on the following morning at 9.30 A.M. I injected twenty-five cubic centimetres. At time of injection pulse 96; temperature 100° F.; respiration 22. Enlarged lymph-glands; hoarseness. Examination of urine, January 12, showed trace of albumin; January 20, none. Membrane disappeared in three days. Erythema appeared January 19; no sequelæ. Discharged, cured, January 31.

CASE XXIII.—Was called to see C. P., female, aged 17 years. January 12, complaining of sore throat. On examination found tonsils and fauces covered with a grayish-white membrane. Diagnosis, faucial diphtheria; hoarseness; enlarged lymph-glands. Suggested the use of antitoxin, which was not consented to until the following day. At time of injection temperature 101° F.; pulse 100; respiration 22. Examination of urine January 13, showed trace of albumin; January 20, none. Erythema appeared January 21, lasted for three days. Discharged, cured, February 3. No sequela.

CASE XXIV.—Was called to see F. W., female, aged 17 months. January 15, 4 P.M. Mother said the child had been sick about forty-eight hours, but she did not think it anything serious. I noticed the child had enlarged lymph-glands. On examining the throat I found membrane on soft palate, uvula, tonsils, and pharynx; nasal inflammation, purulent discharge. I suggested the use of antitoxin, which was consented to by the parents, and at 8 P.M. that evening, in the presence of Dr. J. F. Walsh, I injected ten cubic centimetres of antitoxin serum. The doctor agreed with me that this was a well-marked case of laryngeal diphtheria. At time of injection temperature 101° F.; pulse 120, respiration 24. Thirty-six hours after injection temperature was normal, and, by January 20, membrane had entirely disappeared. Erythema appeared on lower extremities January 26, disappeared three days after; reappeared again on January 31, disappeared February 3. The child's lymph-glands are still slightly enlarged on right side, otherwise she is in good condition. Examination of urine, January 18, showed no albumin.

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CASE XXV.—M. W., female, aged 31 years, mother of the above case, was seized with a chill at noon January 18. The following day she complained of sore throat. On examination found membrane on tonsils and in fauces. Diagnosis, faucial diphtheria. Gave injection of twenty-five cubic centimetres at 4 P.M. Temperature 101° F.; pulse 74; respiration 20 at time of injection; slight enlargement of lymph-glands; membrane disappeared in three days. Erythema appeared in ten days after injection, lasting forty-eight hours. Examination of urine, January 27, showed no albumin; no sequelæ; patient fully recovered. There were two other children in this family, one aged four, the other six years. I gave each one an injection of two cubic centimetres on January 15. They have, up to this time, shown no evidence of the disease.

I immunized four children at the Orphanage; injecting twelve and a half cubic centimetres; one child had a temperature of 100° F. at the time, he subsequently developed diphtheria; the other three have not developed it; they all had slight elevation of temperature and the erythematous rash appeared in six days. I also immunized three other children, using two cubic centimetres; they all had been exposed to the disease, none have shown any signs of diphtheria. The longest time in which it is thought to be protective is six weeks; all the children that were taken sick before antitoxin was received were given Ferri bichloridum and strychnine internally, locally 50-per-cent. solution of lime and sulphur.

No medicine was given after injection. I had used, locally, sterilized solution of boracic acid five times daily. Pulse and temperature were taken every six hours; liquid diet and stimulants; Basham's mixture was given after the first week, five of the children were given strychnine on account of weak hearts, some were given quinine on account of malarial complications.

In Case XI, rectal enemata of peptonized milk and stimulants, and hypodermics of strychnine were kept up for three weeks. Eleven of the above cases were laryngeal diphtheria, two died, one the result of paralysis of the heart, the other was complicated with abortion and rheumatism; the other fourteen cases were faucial diphtheria; they all recovered. This makes a total of twenty-five cases treated with antitoxin serum, with two deaths.

Postdiphtheritic paralysis followed to a mild degree in seven of the cases; all have recovered from this, excepting one case; he is improving rapidly.

Dr. Ravenel, of the Department of Hygiene of the University of Pennsylvania, made cultures in blood serum of secretions, of cases at the Orphanage, and inside of twelve hours pure cultures of diphtheria

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bacilli were produced. The urines in these cases were examined by Dr. L. B. Hirst, of this city. No local reaction followed the injection of antitoxin, general reaction in some of the cases, a rise of one or two degrees in temperature; pulse somewhat accelerated.

In the mild cases, improvement was noticed in ten hours, in the others from twenty-four to thirty-six hours; membrane changes in color and becomes detached. I had a small abscess follow only in one case, it was incised and healed rapidly; it contained about one drachm of pus. Erythema followed in a number of my cases in from eight to ten days after injection. According to a report by Mr. Frank M. Mason, Consul-General at Frankfort, in which he says it has also been found that age has an important salutary effect upon antitoxin.

In the earlier experiments, when the supply of antitoxin was small and temporary, freshly-prepared serum was mainly used, and produced in some cases a slight eruption on the skin; this was the outward sign of a disturbance, the ultimate consequences of which caused some anxiety, but later experience has shown that this eruption is not caused when the serum which has ripened a few weeks is used; instead of degenerating, therefore, antitoxin improves with age, at least, during the first two months, and the best German practitioners no longer use freshly-prepared antitoxin, when that which has undergone the ripening process can be obtained.

MEMORANDA.

THE SUCCESSFUL TREATMENT OF TWELVE CONSECUTIVE CASES OF DIPHTHERIA WITHOUT THE USE OF ANTITOXIN.

DURING the past few months I have had in hospital and private practice twelve cases of diphtheria in whom the Klebs-Löffler bacillus was clearly demonstrated,—and all of whom recovered. In none of these was the antitoxin used for various reasons, not because it was distrusted. At first during the autumn it was unattainable and the later cases were of a kind to scarcely demand extreme measures, which are still in the experimental stage. Had any of these been very severe, I would have at once resorted to antitoxin when obtainable. My reason for reporting these cases is that since it was not convenient to use the new and promising remedy, it is only fair to our older measures that they should be compared with the new,—and this very satisfactory

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series gives 100 per cent. recoveries. I admit the severity was not intense, though some were far from mild. Most of the twelve cases were children and out-patients at the Children's Hospital. In some there was every clinical evidence of the disease; in some it was barely suspected, and the result of the bacteriological examination caused surprise. There were others not counted in this series in whom the state of the throat was most suspicious, but negative results were reported by Dr. Lainé and Dr. Carter who so efficiently aided me.

What astonished me most was the smallness of the constitutional disturbance in those reported upon as showing abundant bacilli,—taken in certain instances from throats showing mild follicular tonsillitis.

The treatment employed was careful cleansing, with absolute rest, judicious feeding (not starving), tonics and alteratives, iron and bichloride of mercury, and in certain cases, when the membrane formed abundantly, trypsalin dusted on. This gave great satisfaction in apparently eating away the growth in a couple of hours, at which time it was again used,—nor was it disagreeable to the patient. In one instance I tried powdered acetanilide along with stearate of zinc,—with what good effect was not clearly demonstrated.

One point I think important, the small amount of stimulus I saw occasion to use,—only in two or three was this pushed,—and the kind most approved was that in the various forms of fluid beef. The bichloride was used in all instances in pretty good-sized doses.

Both my assistants and myself gave a great deal of attention to these people. The dispensary cases were reported to the Board of Health, but treated by us, except two, who were taken to the hospital, who also made a good recovery.

J. Madison Taylor, M.D.,
Professor of Diseases of Children, Philadelphia Polyclinic.

A FATAL CASE OF DIPHTHERIA, TREATED WITH ANTITOXIN.

The following case is of interest in view of the attention now being given to the antitoxin treatment of diphtheria.

The patient was a male infant, 9 months old. It was breast-fed, well-nourished, and vigorous, but somewhat anemic from lack of fresh air and sunshine. The parents are healthy.

It was taken sick on March 11, with an ordinary coryza and bronchitis of very mild type. There was no suggestion of membrane about its pharynx. The following day, March 12, it was so much better that I did not call to see it on the 13th. On the 14th its bronchitis was

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practically well, and the child, in general, had improved. It exhibited, however, a few small blisters scattered about the face, right eyelid, and trunk, particularly in the flexures of the groin. The lesions were about the size of large pin-heads, were raised, rounded, and looked like unusually large varicella vesicles, except that they were not apparently developed at the apices of papules, and had no red base. Nevertheless I was at this time rather inclined to think that the catarrhal symptoms and the eruption might all be due to varicella. The child seemed so well, however, that I did not think it necessary to see it on the following day, March 15. On the morning of the 16th, the vesicles were found to be large blebs, a few reaching the size of hickory-nuts, and those in the flexures of the groin the size of walnuts. There were from a dozen to twenty pemphigus lesions on the entire body, most of them being on the face, neck, and trunk, but a few were on the scalp and forearms. The child looked ill, being pale and depressed, with moderate fever and frequent pulse. It nursed without difficulty or apparent discomfort.

The baby's throat was examined, not because there were any indications of throat-trouble, but because that has become a routine measure. I found a few blebs on the tongue and mucous membrane of the mouth; and on each side of the posterior pharyngeal wall, extending from each posterior pillar of the tonsil nearly to the median line of the pharynx, there was an appearance as though some one had painted on the pharynx a thin coating of grayish-white paint. The tonsils were not involved. The membrane did not extend high up behind the soft palate, nor deep down into the pharynx. While regarding it as probably diphtheritic, the appearance was unusual, and final judgment was suspended. Meantime the patient was given every two hours a teaspoonful of a mixture containing two drachms of tincture of chloride of iron, and simple syrup two fluid ounces. Dr. Carter made a culture from the throat for bacteriological examination. By the evening of the same day, however, and before the results of the bacteriological examination could be known, the appearance of the throat left no doubt that the disease was diphtheria. The membrane had become thicker and more yellow. The use of antitoxin was therefore advised, and it was procured the same night. One-third of a bottlefull of No. 2 solution was injected into the buttock on the night of March 16, and the remaining two-thirds in two portions on the following day. There was no apparent effect from the injections, but the child seemed somewhat better. On the 18th, however, the child was worse. Dr. Carter reported that the colonies, in the culture made, consisted of Klebs-Löffler bacilli. The diagnosis of diphtheria was therefore established. The membrane had extended somewhat, and

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there was cough with some hoarseness. The full-strength antitoxin solution was therefore employed, and given in two portions. Calomel was given to secure a good movement of the bowels, and the iron continued. It is noteworthy that the infant continued to nurse and to swallow medicine and whiskey uninterruptedly, though it was evidently weak and much depressed. The laryngeal symptoms subsided, and there was no further extension of membrane following the last injections, which seemed to me to have been helpful. Nevertheless, the baby was very ill and looked worse than it was, owing to the horrible appearance caused by the black crusts on face and eyelid, left by the pemphigus blebs as they dried.

The infant was removed to the Municipal Hospital on the night of March 19, and died the following afternoon. It continued to nurse, so the mother tells me, until the last.

The diphtheria in this case probably developed on March 15. No suggestion of its presence existed before that date, and no membrane was seen until the 16th. But as no visit was paid on the 15th, it may have existed then. Injections were given on the 16th, 17th, and 18th, and the infant died on the 20th. Apart from the fact that the infant was anemic from too much housing, it should have been a good subject; for it was well-nourished and strong. It is true the surroundings were not favorable to careful treatment of the throat, which was not attempted; but, on the other hand, the infant took abundance of breast-milk and sufficient whiskey, did not vomit, and consequently did not suffer as much from lack of nourishment as do most children. Moreover, the injections were given sufficiently early.

To sum up, the case seems to teach that while the antitoxin may be helpful, it certainly cannot be relied upon as an antidote.

HERMAN B. ALLYN,
Instructor in Physical Diagnosis.

CONGENITAL ABSENCE OF FRENUM LINGUÆ AND VELUM PALATI (TONGUE SWALLOWING).

BY the courtesy of Dr. O. S. Brigham I saw an infant a few days old that exhibited in an extreme degree the condition known as "tongue swallowing." There was no frenum, and the pressure of the tongue against the palatal arch had evidently prevented the growth of the velum palati. There was not a vestige of the soft palate, the edge of the hard palate being sharply defined. The tongue lay most of the time with its tip pressing hard against the posterior naso-pharyngeal wall, and from its constant motion, as in the act of

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sucking, it had excoriated the mucous membrane in this region. It was by considerable effort occasionally thrust into its natural position.

While sleeping, the tongue was evidently swallowed so that it impeded respiration. There was much disturbance of the act of deglutition, and, judging from the coughing excited, some of the fluids entered the larynx.

The tongue itself was well formed, except that it was slightly heart-shaped at the tip, indicating that the absence of the frenum was accounted for by delayed development and union at the tip.

This infant died in about thirty-six hours from inanition.

THOMAS HUBBARD, M.D.

TOLEDO, OHIO.

ALUMNI NOTES.

APPOINTMENTS.

AT a recent meeting of the Board of Trustees of the University, Dr. A. Feree Witmer was appointed instructor in physiology, and Dr. Charles F. Nassau lecturer on bacteriology in the School of Biology.

AT a meeting of the City Board of Trusts held on April 10, Dr. S. Potts Eagleton, of the class of '90, was elected assistant Surgeon to Wills Eye Hospital.

A GIFT TO THE UNIVERSITY HOSPITAL.

DURING the past month the University received gifts amounting to $59,979, including one of $5000 from Miss Helen Louisa Murphy for the endowment of a bed in the University Hospital in memory of her brother.

A SUMMER SCHOOL IN CHEMISTRY TO BE INAUGURATED.

ON July 6 of the present year, the University is to inaugurate a summer school in chemistry, which is to last through six succeeding weeks. It is announced that the course will include the study of four subjects,—elementary inorganic chemistry, qualitative analysis, organic chemistry, and quantitative analysis. A fee of $25 will be charged for the course, which is open to every one desiring to study chemistry. The teachers who will have charge of the work are Dr. Edgar F. Smith, professor of chemistry; Dr. Hermann Fleck, Daniel L. Wallace, J. Bird Moyer, and Owen L. Shinn, instructors in chemistry. This is the first of summer schools established by the University, and will probably be followed by others in law and physics.

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For the Dormitories.

The Provost has announced a gift, by Mr. Robert H. Foerderer, of $10,000 for the erection of a house in the dormitory system.

Necrology.

Dr. John Adam Ryder, professor of Comparative Embryology in the University of Pennsylvania, died in Philadelphia on March 26, 1895, at the age of 43 years.

Dr. Ryder was born near London, Franklin County, Pa., in 1852.

He received a common school education and entered an academy, where his educational course was interrupted by financial reverses to his father. He then adopted his life work, teaching, and entered as a Jessup scholar, under an endowment held by the Academy of Natural Sciences of this city. He readily showed great interest in scientific study and pursuit, and immediately began original research which has made him prominent in scientific circles. Early in life he began the publication of those original investigations that soon stamped him as one of America's foremost biologists. He was called by the late Professor Spencer F. Baird to the position of Embryologist to the United States Fish Commission.

In 1886 he was invited to take the Professorship of Comparative Embryology at the University, and thereafter, although actively engaged in undergraduate and graduate teaching, he still was busy with his pen. The proceedings of the Academy of Natural Sciences, of the American Philosophical Society, the *American Naturalist*, as well as the most prominent of European journals, were enriched by his contributions. His chief writings and papers embrace "The Inheritance of Modifications Due to Disturbances of the Early Stages of Development, especially in the Japanese Domesticated Races of Gold Carp;" "Dynamics in Evolution;" "The Mechanical Genesis of the Form of the Fowl's Egg;" "A Physiological Hypothesis of Heredity and Variation;" "The Origin of Sex through Cumulative Integration, and the Relation of Sexuality to the Genesis of Species;" "On the Mechanical Genesis of the Scales of Fishes;" "The Sturgeons and Sturgeon Industries of the Eastern Coast of the United States, etc.;" "The Development of the Common Sturgeon;" "Evolution of the Specialized Vertebral Axes of the Higher Types;" "A Physiological Theory of the Calcification of the Skeleton;" and "The Origin and Meaning of Sex."

At the last meeting of the Board of Trustees of the University, after Dr. S. Weir Mitchell had paid a warm tribute to the memory of Dr. Ryder, the following minute was adopted:

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"The Trustees of the University of Pennsylvania deplore the loss sustained by it in the death of Dr. John A. Ryder, professor of Comparative Embryology. Called to that chair in 1886, he quitted for it a congenial field of labor under the United States Fish Commission, in which he had rendered great service to the government, and acquired for himself a world-wide reputation. Thenceforth he devoted himself equally, and with a fidelity and effectiveness that ended only with his life, to the work of a teacher and that of an investigator.

"His characteristic traits were modesty, unselfishness, and sincerity in the search for truth. To these were added a rare talent for investigation, strong intellectual capacity, and unremitting industry, and these inured not only to the benefit of the school in which he taught, but to the distinct advancement, both in theory and in application, of the science of biology to which his life was consecrated."

DR. WILLIAM M. KINPORTS, class of '93, died at his home, Cherry Tree, Indiana County, Pa., on February 18, 1895. His death was caused by consumption.

CONGENITAL SPOTS ON ANNAMITES A MEANS OF RACIAL IDENTIFICATION.

AT a recent meeting of the American Academy of Arts and Sciences, Dr. Stephenson, United States Navy, read a paper entitled "Congenital Spots on Annamites a Means of Racial Identification, with Remarks on Linguistics in Connection with Migration of Peoples." Reference was made also to the studies of the Annamese savant, Petrus Truong Urichky, of Cholon (near Saïgon, Cochin China), and to his works on linguistics, comparative philology, etc. Such investigations, as well as examination of bodily peculiarities, enable us to trace the origins and history of various peoples in their world wanderings. The article is published in the *New York Medical Journal* of March 2, 1895.

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EDITORIAL.

SALINES IN THE TREATMENT OF PUERPERAL ECLAMPSIA.

In spite of the fact that the exact etiology of puerperal eclampsia is not known, the value of purgation in the treatment of the disease has long been recognized.

It is a widely-observed clinical fact that in those case of eclampsia associated with and apparently dependent upon renal inefficiency the patient's improvement and recovery occur more frequently when, in addition to treatment directed to the circulatory and nervous systems, prompt, free, and almost continuous action of the bowels has been obtained. Croton oil and elaterium are the purgative drugs upon which most reliance is usually placed. While they sometimes succeed, it very often happens that they do not act, or when a movement is secured, that they cannot be persistently employed to obtain continuous purgation on account of the marked irritation and inflammation of the intestinal tract which attend their free use. As a means towards hastening the effect of these drugs it is worth remembering that an enema, administered when the purgative action of the drug used has been delayed, will often start peristalsis, when the desired effect of the drug given by the mouth is thereby secured. While a simple injection will often be sufficient for this purpose, the "saline enema" commonly employed to excite catharsis after celiotomy is always more efficient. It is, therefore, a useful rule to always add to the enema glycerin and Epsom salts, two to four ounces of the former and one ounce of the latter.

To secure free and almost continuous catharsis, after the first few movements of the bowels there is abundant evidence that no drug answers so well, when the patient can be made to swallow, as a saturated solution of Epsom salts given in small doses, two to four drachms every fifteen to twenty minutes. By this means continuous watery evacuations may usually be secured, and these may be observed, in proportion to the frequency of the stools and the amount of fluid evacuated, cessation of convulsions, improvement in the mental condition, rapid disappearance of edema, not only of the extremities but also of the lungs; and it is, no doubt, true that patients whose lives

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were in immediate jeopardy from pulmonary edema, have been saved by the persistent use of the saline solution throughout a period of forty-eight hours. It should be remembered that the very free catharsis desired rapidly depletes the patient, who should always be given additional draughts of water, and, besides, the action of the heart should be observed, and when indicated cardiac stimulants must be employed. Whatever may be the etiology of puerperal eclampsia, the speedy elimination of stored up excrementitious products, be these waste matters from the body, or, as some would believe, toxines from micro-organisms, the clinical fact remains that up to the present time free catharsis by means of salines is one of the most valuable adjuncts to the treatment of the affection.

UNTOWARD EFFECTS OF ANTITOXIN.

WHEN the antitoxin treatment of diphtheria was first introduced, it was claimed that whatever the merits of the new remedy might be proven to be, it was certainly free from all harmful after-effects. The experience derived from a somewhat extensive use of the serum therapy indicates that the claim is scarcely a just one. Recently a number of careful observers have reported untoward effects, which seem to have been directly traceable to the use of the serum. Erythema and urticaria have been frequently noted, but their appearance is of little consequence. The more serious disturbances which the serum is charged with inducing are: elevation of temperature, swelling of the glands, inflammation of the joints, a greater liability to paralysis, hematuria, and albuminuria. Dr. Lennox Brown reports that a further experience in the use of antitoxin has resulted in six deaths out of a total of eight cases treated, all due to inflammation of the kidneys. Benda (*Medical Press*, No. 2905, 1895) reports that he found in thirty-nine subjects dying under the antitoxin treatment, nephritis in thirty-three, the inflammation being of a severe type in eight. From an analysis of 1000 consecutive cases of diphtheria he found that death under the usual treatment had resulted from uremia in only $2\frac{7}{10}$ per cent., the total mortality being at the rate of $27\frac{4}{10}$ per cent. Monti (*Wiener medicinische Wochenschrift*, No. 5, 1895) also states that the serum exerts an injurious effect upon the system, and that it tends to produce the evil consequences which we have mentioned. Fischer (*Medical Record*, April 6, 1895) reports 225 cases of diphtheria treated with antitoxin, with an average mortality of $15\frac{1}{7}$ per cent. In sixty-eight of this number he observed distinct evidence of nephritis; in 141 others albumin in

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the urine without tube-casts; and in sixty-four hematuria within from thirty-six to forty-eight hours after the injection.

While these untoward effects seem to be directly attributable to the action of the antitoxin, yet it would be unwise to attach, at this time, too much importance to them. They are neither sufficiently grave nor numerous to excite a reaction against a most thorough and impartial investigation of the merits of the new treatment. Moreover, many able authorities still deny that pure serum, from carefully-selected horses, when administered with due care, is capable of producing serious disturbances. Kolisko, of Vienna, after comparing the changes observed in the organs of seventy-five fatal cases of diphtheria treated with antitoxin, with those observed in 1000 cases dying under the old plan of treatment, concludes that serum therapy exerts a distinctly favorable influence upon the infectious process. Von Kahlden (*Centralblatt für Allgemeine Pathologie und für pathologische Anatomie*, Band VI, Nos. 3 and 4) found that the injection of antitoxin into healthy rabbits and guinea-pigs produced no pathological changes either in the heart-muscle or kidneys. Even Monti, who claims that the antitoxin produces unfavorable symptoms, admits that they are of short duration, and do not materially influence the progress of the disease. Virchow, who has been frequently quoted as being opposed to the serum treatment, warmly advocated it in a recent communication to the Berlin Medical Society, and concludes that the occasional ill effects are not sufficient to discourage the use of the remedy. Again, the great reduction in the death-rate of diphtheria, which has apparently resulted from the employment of antitoxin, is a powerful plea for a complete study of its range of usefulness, its indications and contra-indications. In a series of 2740 cases of diphtheria treated with serum, collected by Foster, the average mortality was only 18.54 per cent., while the mortality in an equal number of cases treated by the older methods was 45.36 per cent.

It is fair to presume that experience will tend to improve the technique of production and administration of the serum, and so lessen the untoward effects resulting from its use.

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MEDICAL PROGRESS.

MEDICINE.

UNDER THE CHARGE OF

WILLIAM PEPPER, M.D., LL.D., AND JAMES TYSON, M.D.,

ASSISTED BY

M. HOWARD FUSSELL, M.D.

Cases Simulating Meningitis without Corresponding Anatomical Lesions ("Pseudomeningitis").

Krannhals (*Deutsches Archiv für klinische Medicin*, Vol. LIV, Part 1) reports seven cases in which the symptoms were almost exclusively nervous, and in which the diagnosis of meningitis was made, although some of the more characteristic symptoms were wanting. One case ended in recovery; the termination of another could not be determined; five died. The findings at the post-mortem examination did not confirm the diagnoses, there being no exudate, no inflammatory turbidity, nothing but hyperemia and edema of the pia, and a varying number of hemorrhages in the same membrane. The microscopical examination of two cases confirmed the pre-eminent hemorrhagic character of the affection, and the absence of any real inflammatory changes, if one does not regard as such the edema of the pia, which in reality had the character of an edema due to congestion rather than inflammation. The brain itself showed no inflammatory changes; on the contrary, here and there, in the superficial layers of the cortex, there was a retrograde metamorphosis, a beginning necrosis due to a disturbance of the circulation brought about by the numerous hemorrhages in the pia. Bacteriological examination of the meningeal serum of three cases proved negative. Krannhals seeks to explain an intimate relationship between influenza and these cases of "pseudomeningitis," occurring as they did during the spring of 1890, following the influenza epidemic. He believes that the symptoms of the cases of "pseudomeningitis," due to some infectious process, and of acute meningitis in general, depend especially upon the action upon the central nervous system of certain toxines, and secondarily upon the anatomical lesions present.

Acute and Chronic Angio-Spastic Cardiac Dilatation.

Jacob (*Centralblatt für Innere Medicin*, No. 5, 1895) describes a class of cases, the symptoms of which consist essentially in a very acute, transitory dilatation of the heart, which from frequent repetition of the attacks becomes permanent. A person apparently well is suddenly attacked with a chill, and often with pain in the skin, or in one extremity, or in the abdomen. The skin is really cold, sensation much diminished, face pale and often covered with sweat. Patient complains of paresthesias of the limbs. If vertigo and dimness of vision follow, the pupil is much dilated. Patient is anxious, has dyspnea, and pain in the region of the

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heart; pulse is hard, artery small, but slightly compressible,—a solid cord. The area of cardiac dulness increases; the apex-beat becomes stronger, and within an hour or two displaced downward and outward one or more centimetres; pulsation at end of sternum and in four to six intercostal spaces. In severer cases pulmonary edema and albuminuria appear. This condition lasts for from a few hours to as many days, until suddenly warmth returns to the skin and the paresthesias, vertigo, dilatation of pupil, etc., disappear; then the anxiety, dyspnea, and cardiac pain, pulmonary edema, albuminuria, and cardiac dilatation, the latter requiring a full week for its completion. Repeated attacks, although slight, cause permanent dilatation of the heart. The nature of the affection consists in a spasm of the general arterial system, producing such a resistance to the onward plan of the blood that the heart, being unable to overcome it, must, in consequence, dilate. The results of therapy tend to confirm this view. Heart-tonics are of no avail. In acute cases, injections of morphia are of greatest service. Chronic cases are much benefited by judicious use of carbonated baths.

Cardiac Arhythmia in Children.

Heubner (*Zeitschrift für klinische Medicin*, Vol. xxvi, Parts 5 and 6, 1894), gives the following causes of cardiac arhythmia, excluding in this study tuberculous meningitis and organic disease of the heart in which its occurrence is well known.

(1) Following poisonings,—by digitalis or opium (?).

(2) Accompanying digestive derangements,—auto-intoxications.

(3) In intra-abdominal affections, especially those accompanied by vomiting, and in which no other symptoms of poisoning exist.

(4) During the course of infectious diseases. (*a*) During the development and at the height of the disease,—rather rare. (*b*) During convalescence from diphtheria, scarlet fever, measles, pneumonia, typhoid fever, etc.,—much more common.

(5) In anemic and nervous children.

(6) Intestinal parasites (no personal experience).

(7) Physiological conditions to which children more than adults are susceptible,—emotional disturbances, cold baths, etc.

(8) Idiopathic cardiac arhythmia (no personal observation).

Cases under classes Nos. 3, 6, and 7 are to be looked upon as being reflex; those under Nos. 1 and 2 are possibly due to a direct action of the poison on the heart-muscle and upon the central regulating cardiac mechanism. Cases of class No. 4 are also in all probability due to a direct action of the toxine upon the heart-muscle. The cause of the arhythmia in the cases of class No. 5 is unknown.

Various as are the causes of cardiac arhythmia in children, the cases are mostly of a transitory nature, and usually yield to a few general rules of treatment which are given.

Hemorrhagic Nephritis in Diphtheria.

Treymann (*Deutsche medicinische Wochenschrift*, December 20, 1894) reports a case of diphtheria in which, because of the unfavorable progress of the case, repeated injections of Behring's antitoxin were used. The fourteenth day of the disease (the eleventh of treatment), the day following the fourth injection, the child developed a hemorrhagic nephritis, accompanied by high fever and an

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eruption resembling measles, from which, however, it recovered, albumin disappearing from the urine at the end of five days.

SCHWALBE (*Ibid.*) reports a case of diphtheria which, because of laryngeal stenosis, was tracheotomized as soon as admitted to the hospital. Excepting this there was no particular treatment, no antitoxin being used. On the twenty-fifth day of the disease (the twentieth of treatment) the patient complained of severe headache; some edema of the face developed. The following day a hemorrhagic nephritis was very evident. The patient, however, recovered, the urine being free from albumin at the end of twenty-eight days. Schwalbe draws attention to the similarity between the two cases, and cautions against the *post hoc, propter hoc* argument in our judgment of the symptoms following the injection of the antitoxin.

PRESYSTOLIC APEX MURMUR OF AORTIC REGURGITATION.

FISHER (*Lancet*, March 9, 1895), cites a case and remarks that a low-pitched presystolic murmur may occasionally be heard at the apex in cases of aortic regurgitation. The high-pitched, blowing diastolic murmur may possibly be audible from base to apex, and even in the axilla, but just at the apex a rumbling sound takes its place. It may be made to disappear by pressure of the stethoscope, and thus be overlooked. "In this instance, the presystolic bruit was not low-pitched and rumbling, but of that loud, rolling character which reminds one of the sound produced by a flapping sail as it is filled by a puff of wind. Well-marked though the murmur was, the mitral orifice proved to be of natural size." There was also present a presystolic thrill at the apex. Fisher also mentions that presystolic apex murmurs may occur unassociated with either mitral stenosis or aortic insufficiency, being due simply to adherent pericardium, and suggests that in both of these conditions simulating mitral stenosis, the innervation of the heart may be, in some obscure way, affected, giving rise to the production of the murmur.

THE DIAGNOSIS AND THEORY OF MORBUS BASEDOWII (GRAVES'S DISEASE).

LEMKE (*Deutsche medicinische Wochenschrift*, December 20, 1894) comes to the following conclusions concerning Graves's disease: (1) A patient suffers with Graves's disease as soon as delirium cordis and tremor are present. All other symptoms are consecutive and of secondary nature; they simply confirm the diagnosis. (2) The cause of Graves's disease is in all probability to be sought in a faulty chemical influence exerted on the blood by the thyroid gland. (3) Graves's disease, therefore, is no disease of the nervous system; one requires for its diagnostication no special neurological knowledge. He believes the diseased product of the thyroid gland to be a special muscle-poison, the delirium cordis being the result of this poison exerted on the heart-muscle and the tremor, the result of the same poison on the skeletal muscles.

MASKED DIPHTHERIA.

HEUBNER (*Deutsche medicinische Wochenschrift*, December 13, 1894), calls attention to the occurrence of masked diphtheria, reporting three cases, two of which died. Masked diphtheria is spoken of as being secondary, affecting always sick or sickly children, beginning and progressing insidiously, suddenly manifesting itself by the production of marked laryngeal stenosis, or by the death of the child

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in collapse. Respecting the remarkable deviation from the ordinary course of diphtheria, and the difficulty of diagnosis in such cases, two points are to be especially considered. (1) The patients who—being constitutionally weak (scrofulous, rachitic)—respond but slightly to the infection. (2) The indistinct nature of the disease itself which never assumes any particularly positive character. Conclusion: Whenever, in a child constitutionally sick, there occurs any sudden change accompanied by fever and catarrhal symptoms, always make a bacteriological examination of the secretion.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

ASSISTED BY

G. G. DAVIS, M.D., M.R.C.S., AND ELLWOOD R. KIRBY, M.D.

Fracture of Hyoid Bone; Acute Bulbar Paralysis; Recovery.

Ramsden (*Lancet*, December 8, 1895) gives the case of a man, aged 50 years, who, while engaged in unloading a wagon, fell a distance of four yards on his head. He was feverish and delirious for the next fourteen days. Speech was unintelligible, and he could swallow solids and liquids only with difficulty. Saliva dribbled constantly from his mouth. The hyoid bone was found broken in two places, at the junction of the body and greater cornua on each side. Later the right half of the tongue was found to be atrophied and was protruded towards the right. The lips were slightly wasted, and in swallowing the liquid regurgitated into the nose. The treatment adopted was wearing stiff collars and administration of tonics. Eight years later, though speech is impaired, it is intelligible, the dribbling of saliva has ceased, and he can blow and whistle, and, with the exception of occasional pain, the neck is well. The fractures united by fibrous union. The question of diagnosis rested between (1) acute bulbar paralysis, (2) injury of hypoglossal nerve at the seat of fracture, (3) hemorrhage into the vagus centre, and (4) labio-glosso-laryngeal paralysis. This last is always progressive and fatal. Hemorrhage into the vagus would account for the difficulty of speech and swallowing, but would not account for the atrophy, besides, there was no vomiting or other symptoms pointing to the vagus. The difficulty of swallowing and altered speech would not have been so extreme in unilateral lesion of the hypoglossal nerve, though the fracture would complicate matters. The extreme symptoms are in favor of acute bulbar paralysis. There were no epileptiform convulsions, and the arms and legs were not affected, but these symptoms are by no means always present in acute bulbar paralysis. The actual lesion was an embolism or hemorrhage in the medulla, most probably occurring at the time of the accident.

Operation for Cerebellar Abscess.

Deanesly (*Lancet*, December 8, 1894) details a case of cerebellar abscess from middle-ear disease in a boy 16 years of age treated by operation. A semicircular

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flap of ten inches radius was turned down behind the left ear. The pin of a one-inch trephine was placed one and a half inches behind and one-half inch above the centre of the external auditory meatus. The lateral sinus laid at its posterior and lower half. The opening was enlarged upward and brain explored with a fine hydrocele trocar in various directions. The bony opening was then enlarged downward and backward and the dura incised well below the lateral sinus. The same trocar was thrust inward and forward for an inch and a quarter but struck nothing; but one slightly larger allowed several drachms of thin, yellow, inodorous pus to escape. A drainage-tube was inserted and gauze plug put in. No part of the bone was replaced. The patient recovered. In cases not unduly complicated with suppuration of the middle ear the above operation is to be preferred to that of Macewen, who first opens the mastoid antrum and thence proceeds further as the case requires.

Laparotomy for Perforation in Typhoid Fever.

Parkin (*British Medical Journal*, January 26, 1895) gives the history of a case in which the perforation was promptly diagnosed and operated on only two hours after it had occurred. The patient died three days after the operation. The author states that this added one more to the list of twenty such cases which had been so treated with only one recovery. There is no doubt that perforation in the course of enteric fever is almost invariably fatal, and any recovery from such a complication can only be regarded in the light of an accident unless surgical treatment be adopted.

Treatment of Obstruction of the Bowel by Electricity.

Althaus (*British Medical Journal*, January 26, 1895) gives the details of two cases in which he was enabled to produce passages from obstructed bowels by means of electricity. An insulated sound with free metallic end was introduced into the rectum and a moistened conductor applied to the parietes chiefly in the region of the sigmoid flexure. The primary faradic current was sent through and its force gradually increased until the patient experienced a decided feeling of vibration in the bowel. This was done in one patient at ten o'clock A.M. and the same evening he had a copious movement.

In the second case the application was made at half-past five P.M., and a good motion followed at one o'clock A.M. The method employed by Boudet and Laral of injecting some salt-water in the rectum to act as an electrode is also mentioned. The author states that if electric injections were made soon after the appearance of bad symptoms, and laparotomy followed quickly after failure of electricity, the electrician, as well as the surgeon, would have a better chance of saving the patient's life than now, when they are often called in too late.

Biliary Calculi.

Thiriar (*Gazette Hebdomadaire de Médecine et de Chirurgie*, August 12, 1894) gives several cases illustrative of the surgery of the biliary tracts, and concludes as follows: Choledochotomy is clearly indicated in those cases of impaction of a calculus in the hepatic duct producing chronic icterus and symptoms of cholemia.

When there exist, along with the calculous obstruction of the duct, calculi in

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the gall-bladder which necessitates the opening or removal of that organ, then crushing may be resorted to with subsequent catheterization of the bile-duct. Pregnancy is not a contra-indication in such cases of biliary obstruction demanding operation.

VESICAL IMPLANTATION OF A DIVIDED URETER (URETERO-CYSTONEOSTOMY).

BAZY (*Annales des Maladies des Organes Genito-Urinaires*, July, 1894) gives the details of two cases in which the ureter had been divided in the removal of the uterus for fibroma. The divided ureter in each case discharged its urine into the vagina.

The operation is performed as follows: Open the abdomen in the median line and search for the lower end of the upper portion of the divided ureter. This is apt to be distended with urine which should be removed by an aspirator. The bladder should then be incised at the point nearest to the end of the ureter. The ureter is placed in the bladder and fixed by sutures.

In the first case it was found so difficult to isolate the end of the ureter, as it was embedded in a cicatricial mass, that further procedures were stopped and the abdomen closed. Two months later, when the patient was in a better condition, another attempt was made, this time successfully. By means of a blunt trocar, introduced through the urethra, the bladder was made to project at the point nearest to the ureter, and a small incision made, into which the end of the ureter was sutured with fine silk. The peritoneum was dissected up and sutured to the peritoneum of the ureter by catgut stitches. A No. 13 Nélaton catheter was conducted through the trocar and into the ureter, and another left in the bladder. The two tubes were sutured with silkworm gut to the labium minor. In the second case the author assisted Peyrol to operate, and what was supposed to be the ureter was sutured in the bladder, but it was unsuccessful as the urine continued to come from the vagina. A second operation was successfully performed by the author eight months later. At the first operation it was only a mass of fibrous tissue which, being mistaken for the ureter, had been sutured in the bladder.

PERITYPHLITIC ABSCESS NOT DUE TO APPENDICITIS.

HOMANS (*Boston Medical and Surgical Journal*, December 13, 1894) gives the details of a case of abscess in the right iliac region occurring in a child 4 years of age. There was pain to right of and around the umbilicus, also distention of abdomen and tenderness. The pulse was 120, and temperature 103° F. A dose of oil produced only a slight movement. On opening the abdomen the healthy bowels were seen, and to the right of the umbilical region was a level surface of grayish color. This was the roof of an abscess, and on it lay the healthy appendix. The abscess was evacuated and recovery ensued, the appendix not being disturbed. Except for the youth of the patient and the fact that the appendix was normal, the case did not differ from others that are called appendicitis when operated on, and in which the appendix does not happen to be seen.

ACTION OF CHLOROFORM ON THE HEART.

GUERIN, in a paper read before the French Surgical Congress (*Revue de Chirurgie*, 1894, p. 915), claimed that death from arrest of the heart's action in chloroform anesthesia could be avoided by allowing the respiration of the vapor by the mouth only. He held that arrest of the heart was not due to the action

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of the drug on the cardiac muscle, but was caused by a reflex influence from the nasal nerves, which produced inhibition of the heart through the pneumogastric. Chloroform was administered to a rabbit through a tracheal tube; the heart was not influenced. The trachea then being cut, chloroform was applied to the nose, and immediately the heart was arrested; as the trachea had been divided no vapor reached the bronchi. He claimed that death from arrest of the heart's action was no longer to be feared, provided the nostrils of the patient were closed by the fingers until anesthesia was accomplished.

Tearing Out of Nerves as a Cure of Neuralgia.

Adenot, at the French Congress of Surgery (*Revue de Chirurgie*, 1894, p. 919), advocated, in neuralgias, section of the nerve as high up as possible, then seizing the peripheral end with a pair of forceps it is to be wound around it until as much is removed as possible. Eight or ten centimetres can thus be taken away. Good results have been obtained by this method of treatment by Mollière, Tripier, and Gangolphe. Chipault also spoke favorably of the method, having had a complete success with it in a case of neuralgia of the forearm which had previously resisted section of the ulnar nerve.

Restoring Persons Apparently Dead from Chloroform.

Leedham-Green (*Birmingham Medical Review*, February, 1895) calls attention to the König-Maas system of rapid compression of the precordium as used in Göttingen. The case on which he tried it was a child four months old. The operation of circumcision had nearly been completed when the child became deadly pale, the pupils dilated, and the respiration and the heart's action ceased. The child was apparently dead. The surface became pale and cold, the eyes shrunken, pupils widely dilated, and there was a collection of froth at the mouth. Rapid compression (about 120 per minute) of the precordium was followed by a faint gasp and ultimate recovery. Seven minutes had elapsed during which neither heart-beat nor respiratory effort could be detected. Sylvester's method which was first used, was totally inadequate.

Sarcoma of Abdominal Cavity Cured by Toxines of Erysipelas.

Mynter (*Medical Record*, February 9, 1895) relates the case of a girl, aged 12 years, well developed, extremely pale and short of breath, being unable to lie down, who had a swelling in the left inguinal region. The abdomen enlarged, the urine was passed involuntarily; temperature 102° F.; pulse 130, small and weak. Laparotomy being performed, revealed about two quarts of a thick, odorless, chocolate-colored fluid, and there was also an inoperable growth involving both the parietal peritoneum, the mesentery, pelvic organs, and cecum. A piece as large as a fist was removed. Gauze tamponning was employed. Then followed a profuse discharge of the same kind of fluid as already described. On the fourth day and each day thereafter there was injected in the upper end of the femur one grain of filtered toxines of erysipelas, obtained from Dr. Roswell Park. During the next week, while the discharge still kept up, masses of necrotic tissue of the size of large oysters were cast off. The discharge became gradually less and more purulent in character, and the tumor appeared to be receding and the abdomen getting smaller. The patient was discharged about two and a half

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months after the operation with a small sinus. Microscopic examination of some of the large pieces showed masses of round and elongated cells with some pigment. In portions of the growth no cellular elements were visible, the specimen having a coarse fibrous appearance. Blood-vessels through the tumor were quite numerous. Neurotic changes were observed in some parts, and Dr. Thornberry, who examined the growth, regarded it as sarcomatous.

Injuries of the Semilunar Cartilages of the Knee.

Pauzat (*Revue de Chirurgie*, February, 1895, p. 97) gives the results of his investigations on the anatomy, physiology, and pathology of the semilunar cartilages. Rupture of the cartilages is diagnosed by,—

(1) The subcutaneous ecchymosis.

(2) Pain elicited by pressure on the cartilage.

(3) The appearance of an enlargement of the meniscal prominences appreciable by touch and sometimes by sight.

The treatment recommended is compression with cotton and immobilization. Luxation of the cartilages outward is the most frequent injury, and is usually the only one recognized clinically. A projection of the cartilage appreciable in certain positions of the leg is the most important and constant symptom. It is not allowable to diagnose a luxation in a case in which pain is felt on rising from a crouched position. This is due in most cases to partial tears of the cartilages or menisco-patellar folds. Luxations inward, behind, and in front are not known clinically. In them the prominences of the cartilage disappear. In treating these luxations, extensive movements of the limb, flexion, extension, and rotation tend to replace the cartilage. Subsequently rest is to be advised, the part is to be bandaged in cotton, and the joint immobilized in an extended position. This treatment should be pursued for several months. If this fails, it is perfectly proper to open the joint and suture the anterior part of the meniscus to the retracted menisco-patellar fold (operation of Annandale), or excise the displaced cartilage.

Dispersible Tumors of the Breast.

Snow (*American Journal of the Medical Sciences*, March, 1865) describes mammary tumors occurring in females between the ages of 14 and 25 years. He names them the "fibroma of adolescence," and treats them as follows: Moderate the injunctions of fashion in the matter of stays; tranquillize the nervous system; abolish tea; and order some absorbent ointment with frequent local friction. The lump will disappear in a few weeks, seldom more than six. He uses pulv. plumbi iodidi, ʒi; lanoline, ℥vi; adipis ad, ℥i; to be well rubbed in four times daily. Sometimes he uses green mercuric iodide, twenty grains to the ounce, employed night and morning; also two drachms of the British red iodide ointment in place of the same quantity of ung. plumbi iodidi. Fifteen grains of bromide are usually given at bedtime. Treating in this manner he has not found it necessary to subject any such case to operation since 1889.

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THERAPEUTICS.

UNDER THE CHARGE OF

HORATIO C. WOOD, M.D., LL.D., AND ARTHUR A. STEVENS, M.D.

PRACTICAL POINTS IN THE TREATMENT OF DIPHTHERIA WITH ANTITOXIN. INDICATIONS AND CONTRAINDICATIONS.

FISCHER (*Medical Record*, April 6, 1895) states that of 225 cases of diphtheria, in which he has employed the antitoxin treatment, thirty-five have died. Twenty-two cases were under 5 years of age; sixteen of the latter were under 3 years. His mortality has, therefore, been equivalent to 15½ per cent., although his percentage of cures in the first thirty-four cases was only $5\frac{8}{10}$ per cent. This high death-rate he attributes to the fact that the antitoxin was used in a great many cases which were regarded as hopeless.

The contraindications for the usage of antitoxin, according to the author, are: (1) Cases of mixed infection; cases of a scarlet fever complicating diphtheria; cases of measles complicating diphtheria; cases of chicken-pox complicating diphtheria, and so on. (2) Cases that are moribund. (3) Cases that appear to be true septicemia, where we have rather a result of the diphtheria than a real diphtheria to contend with. (4) Cases which show a distinct evidence of casts and large quantities of albumen should not be injected with antitoxin.

In the application of the remedy the following suggestions are offered: (1) To apply the remedy as soon or as early in the disease as possible. (2) To inject a sufficient quantity. (3) To remember that the remedy is absolutely harmless. (4) That it can be used for prophylactic purposes by injecting the one-tenth part necessary for healing an acute case of diphtheria. (5) That the use of antitoxin does not render local antisepsis, the use of stimulants, and careful hygienic regulations unnecessary.

The technique of the injection consists: (1) A careful sterilization of the skin at the seat of injection,—the interscapular space or the pectoralis region. Sterilization consists in washing the skin with soap and warm water, then sponging with a 1000 to 2000 sublimate solution. (2) The hands of the physician must be carefully cleaned and rendered aseptic. (3) The syringe should be completely sterilized by boiling fifteen minutes in a soda solution. The needle should be dipped in alcohol, followed by a 2-per-cent. solution of carbolic acid. (4) It is necessary to inject slowly; at the same time to have the proper quantity of serum drawn into the barrel of the syringe, so that no time is lost. The needle should be pushed into the deep cellular tissue, at least two inches in a semi-horizontal position. (5) Massage of the fluid injected should not be practised. Finally, it is well to apply a very small pledget of absorbent cotton over the injected space. The injected spot can also be sealed by dropping collodion over it.

The absorption of the antitoxin takes usually from one-half to one hour.

If given with the above precautions, the writer believes it to be a safe remedy, capable of curing every case of diphtheria which is treated early.

TREATMENT OF URIC ACID GRAVEL.

VAUGHAN HARLEY (*British Medical Journal*, March 23, 1895) concludes an article on the pathology and treatment of uric acid gravel with the following directions as to treatment:

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The treatment of uric acid gravel takes two directions, according as we desire to increase the solubility or decrease the amount of uric acid formed. It is well to remember that in the majority of cases uric acid deposits are due to an increased tendency to precipitation, and not to excessive formation of uric acid.

In cases due to an increased tendency to precipitation, we have to give drugs which help to hold uric acid in solution. Piperazine is of great service, particularly in all cases in which gravel has been due to diminished solvents and not excessive formation of uric acid. It has no action on the quantity of uric acid formed, but merely on its solubility. On this account it is best given in combination with alkalies. The diet in these cases is not of so much importance except in favor of salines and vegetables.

In cases, again, when the uric acid deposit is due to excessive formation, a carbohydrate diet is most useful. The old idea that sugar causes an increase of uric acid has no foundation. Alcohol, on the other hand, should be prohibited, as it causes an increase in the uric acid voided. Quinine and arsenic decrease the quantity of uric acid because they diminish the quantity of leucocytes, and therefore, in cases where gravel is due to an excessive formation of uric acid, they are most valuable. While moderate muscular exercise is of service, excessive exercise is harmful. In cases of excessive formation, although alkalies are of some assistance, they, like piperazine, are only of secondary importance by increasing the solubility of uric acid formed.

The Treatment of Nervous Disturbances of the Heart Resulting from Influenza.

Sansom (*Practitioner*, April, 1895) furnishes a practical article on the above subject. He advises as a routine practice the use of sulphocarbolate of sodium in doses of twenty to thirty grains, every two, three, or four hours, according to the severity of the case. The diet should be almost entirely liquid. Alcoholic stimulants should be administered with caution. Champagne diluted with Apollinaris, or brandy in dessertspoonfuls every three or four hours with milk and soda-water. When the temperature rises above 103° F., quinine is the best antipyretic. Phenacetin or antipyrin gives comfort, but their action must be watched as they sometimes increase the already profuse perspirations. Pains are best controlled by phenacetin or antipyrin, unless profuse perspiration or signs of nervous prostration are contraindications.

In profound adynamia the writer knows of no more efficient remedy than musk in five-grain doses.

The hypodermic injection of brandy, ether, or strychnine may be called for.

During convalescence, for several weeks, the sulphocarbolate of sodium with Fowler's solution is to be given three times a day after meals, and the nasopharynx repeatedly sprayed with an antiseptic solution like the following: Camphor and menthol, of each twenty grains; pure carbolic acid, one-half drachm; parolein, four ounces. The signs and symptoms referred to the heart resulting from influenza in the author's cases were thus distributed: In 100 cases: pain referred to the heart, 23 cases; tachycardia, 37 cases; irregular heart, 25 cases; bradycardia, 5 cases; organic disease of the heart, 10 cases.

For heart-pain after influenza, complete rest, morphine hypodermically (one-fourth to one-third grain) with diffusible stimulants are the remedial measures recommended. Once the severity is mitigated, five grains of quinine dissolved in hydrobromic acid is preferable to morphia.

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For more continuous treatment of the early painful phase, sodium bromide (twenty grains) with Fowler's solution (three minims) three times a day after food is recommended. In some cases sodium iodide (five grains) is added with benefit. When pain is persistent, local treatment is useful. Mustard poultices sprinkled with tinctures of opium, belladonna, and aconite give relief in some cases. In others a fomentation of lint soaked in a hot solution of sodium salicylate is very efficacious; or an ointment, containing 20 per cent. of salicylic acid and 10 per cent. of menthol in a fatty basis of lanolin and lard, may be rubbed in over the painful area. In more chronic cases small blisters prove efficient.

In tachycardia, or palpitation following influenza, the writer considers digitalis and analogous cardiac tonics not only useless but dangerous. The mixture of sodium bromide with small doses of arsenic, as suggested for the treatment of the cardiac pain, is perhaps most generally useful.

For the insomnia, chloralamide (twenty to twenty-five grains) at bedtime is regarded as the most useful and least harmful hypnotic. Opium, the author thinks, should be avoided or reserved for emergencies.

For continuous tachycardia, a galvanic current from a Schall's four- or six-celled battery is recommended, the anode held over the nape of the neck and the cathode gently pressed into the groove of the neck outside the larynx. Abnormal retardation of the pulse-rate may be relieved by phenacetin and camphor, with local warmth and counter-irritation of the epigastrium and abdomen.

Permanent bradycardia is serious. Tincture of belladonna (ten minims thrice daily), massage, and graduated muscular exercise are useful; but it must be realized that the condition of very slow heart is one of peril.

Sheep's Thyroid in Graves's Disease.

Voisin (*Semaine Médicale*, October 24, 1894) reports the case of a woman, aged 32 years, afflicted with exophthalmic goitre, to whom was given six to eight grammes of sheep's thyroid daily before meals. Marked improvement followed the treatment. The patient continued to take small amounts of the gland daily, omitting its use, however, for ten days every three weeks. Finally all symptoms disappeared except a slight swelling of the neck and slight exophthalmos. Dreyfus, Brisac, and Beclerc declared that in their hands the remedy had aggravated the symptoms of the disease.

Hypodermic Use of Arsenic in Leukemia.

Rummo (*Riforma medica*, No. 98, 1894) strongly recommends arsenic in leukemia and pseudo-leukemia. Fowler's solution is painful. The author uses a solution of arsenite of soda (two grains to the ounce), and begins with a dose of one-twenty-seventh of a grain. The dose is gradually increased through fifty injections until nearly half a grain is reached. During the treatment great care is necessary to detect toxic manifestations. According to the writer, it is necessary to push the drug until signs of intolerance begin to appear. He thinks that, given in this way, it is by far the most satisfactory of all the remedies recommended for leukemia.

Caffeine in Diseases of the Respiratory Organs.

Skerritt (*Practitioner*, April, 1895) calls attention to the value of caffeine in bronchial asthma, and in bronchitis associated with spasm of the bronchial tubes.

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When a paroxysm of asthma is present he prescribes five grains of the citrate of caffeine every four hours until relief follows. When the attacks come on regularly in the early morning, a dose of five or ten grains at bedtime often serves to avert them. No ill effects have followed the treatment, even when continued for years. The drug sometimes causes slight wakefulness, but, as a rule, patients go to sleep without difficulty after the nightly dose of five or ten grains.

OBSTETRICS.

UNDER THE CHARGE OF

BARTON COOKE HIRST, M.D.,

ASSISTED BY

RICHARD C. NORRIS, M.D., AND FRANK W. TALLEY, M.D.

Hematoma of the Vulva Incident to Parturition.

Glasgow, of Lexington, Va. (*Virginia Medical Monthly*, February, 1895), reports the following case of pudendal hematocele: He was called, December 1, 1894, to attend a 32-year-old II-para in confinement. The labor progressed normally, head presenting in l. o. a., and when the os was fully dilated was terminated by four or five hard, expulsive pains. There was a slight laceration on the inner surface of the left labium majus, which did not require suture. Five hours after he was called to see the patient and found her with a weak and rapid pulse and suffering acute pain, similar in character to labor pains. There was considerable hemorrhage, and in the left and anterior vulvo-vaginal regions a large hematoma had formed, which extended well up into the submucous areolar tissue on the anterior and left sides of the vagina and also the subcutaneous areolar tissue of the left labium majus, forming a tumor as large as a cocoa-nut. The hemorrhage was controlled with cold compresses and morphia and stimulants administered.

On the next day the clot had formed, and cloths wet with hot bichloride-of-mercury solution were kept constantly applied to the tumor to favor absorption. On the eighth day there were signs of the clot breaking down and the discharges began to have a foul odor. The patient had a chill followed by fever and sweating. Glasgow then opened the cavity, turned out the clot and packed the opening with iodoform gauze. The after-treatment consisted in supporting internal medication and daily irrigation. She made a good recovery.

Spontaneous Reposition of the Uterus.

Vogt (*Norsk Magazin for Lägevidenskaben*, p. 647, 1894) reported a case which he had observed of spontaneous involution of the uterus after acute inversion. It was that of a primipara, 42 years old, who had been delivered by the aid of forceps and the placenta had been expelled. Compression of the uterus and vaginal arch was performed to arrest hemorrhage, when the hand, introduced into the vagina, felt the uterus move and the fundus descend. The other hand applied to the abdomen could feel no trace of the uterus. Hot water was immediately injected, when the uterus ascended, resuming its normal position.

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Sequelæ of Symphyseotomy.

Tissier (*Archives de Tocologie et de Gynécologie*, February, 1895) exhibited recently at a French society a woman upon whom he had performed symphyseotomy six weeks previously. She was a multipara and rachitic. The conjugate was about three inches. Her previous labors had been severe. Labor was induced by Tarnier's bags and the forceps applied three times without result. Symphyseotomy was then performed. The hemorrhage was free. When the pubic bones parted a prolapse of the pelvic organs was distinctly observed. Delivery was accomplished with ease. There was troublesome tympanites about the third day. By the seventeenth day the symphysis was not consolidated and the pubic bones still slid on each other a little, consequently the patient could not walk long without feeling fatigued. A thrombus developed around the levator ani on each side during the puerperium, but both became absorbed. The child died when a few weeks old. The question as to the cause of the tympanites was raised at the society. Tissier believed it to be due to the prolapse of the uterus, which intercepted the free descent of the flatus. Fournel believed it to be due to temporary intestinal paralysis, as is frequent after abdominal section.

Premature Births.

M. Villemin (*Universal Medical Journal*, March, 1895) reported before the Société Obstetricale et Gynécologique the case of a 2-year-old child, born in the sixth month of pregnancy. That the child had not had six months of intra-uterine life he could vouch, the statement being borne out by the last menstrual period of the mother, the date of the first fetal movements, the child's weight, which was thirty and a half ounces, and its appearance.

Budin had had this infant under observation from the beginning and corroborated Villemin's statements. He had examined infants of six or seven months that had cried and lived a few days and had found the alveolar cavities filled with epithelial cells, the lung sinking when placed in a vessel of water.

Charpentier reported a case of premature birth in his practice, the child being not more than 6½ months and weighing thirty-three and one-third ounces. So sure was he that it would not live that he placed it in a basin while he was attending to the mother. After the mother was attended to, the child being still alive, he wrapped it in cotton, and was surprised next day to find it alive. It was then placed in a small well-heated room and fed with a spoon on human milk; on the twelfth day it could take the breast, and since it has thrived and grown.

Gonorrheal Fever during the Puerperium in a Woman who had not Undergone Vaginal Examination.

Leopold (*Centralblatt für Gynäkologie*, No. 29, 1893) reports the case of a woman aged 18 years, who gave birth to a child at term, after labor of seven hours and forty minutes. The perineum was not lacerated. No examination was made before labor. Two days after delivery the lochia became fetid. The vagina was irrigated with a 1:4000 sublimate solution. The temperature rose to 101.5° F. Three days later there was slight headache and the vagina was found to be covered with a greyish deposit. The cervix had been torn on the right side and showed a greenish-gray lining. The fever subsided after intra-uterine irrigation with 1:40 phenol solution. A bacteriological examination of the cervical deposit showed masses of diplococci and in several places typical gonococci. Leopold draws the following conclusions:

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(1) A woman may have fever after labor, though no internal examination has been made.

(2) The cause of such fever may be the presence of the gonococcus on and within the cervix.

(3) Simple vaginal irritation may not be sufficient in order to reach the infected locality.

(4) A woman who had no suspicious vaginal dischage, either before or after labor, nevertheless showed undoubted signs on the fourth day of the puerperium of gonorrheal infection.

(5) In such a case the fever cannot be legitimately regarded as due to auto-infection.

(6) When a woman is normally delivered, without having undergone vaginal examination, and develops fever on the third day after, there is ground for suspecting gonorrheal endometritis, and no blame can attach in such a case to any of the attendants who assisted at the confinement.

Diabetes in Labor and Pregnancy.

Ludwig (*Centralblatt für Gynäkologie*, No. 11, 1895) observed a severe case of diabetes in pregnancy. The patient was a 42-year-old IX-para. She was admitted to the hospital December 14, 1894, in an almost dying condition. She had suffered from marked diabetes for two and a half years. Her pregnancy began in April, 1894. She was troubled with pruritus vulvæ, but this symptom grew better. A few days before her admission to the hospital the size of her abdomen suddenly increased and she became very ill. The urine contained 3.8 per cent. sugar. On admission the patient looked very ill and was hardly conscious. The urine was of a specific gravity of 1018, but the percentage of the sugar was 2.3, and acetone and aceto-acetic acid were present in considerable quantity. The membranes were ruptured and nearly nine pints of liquor amnii came away. Ten hours later a male fetus, in a high state of maceration, was delivered spontaneously. For two days the patient was very ill, vomiting all food. Enemata of salt solution, with peptone and wine were given. On December 16 she had an appetite, and on the 24th she left in good condition. There was practically no milk, nor could any pure blood be obtained by any justifiable means. The percentage of sugar in the patient's urine rose on December 17 to 2.5 per cent., falling to 0.8 per cent. in twenty-four hours. The day before discharge it was 0.1 per cent., and the specific gravity 1009. No aceto-acetic acid, and but a trace of acetone remained. The liquor amnii contained 0.3 per cent of sugar. It is not certain if the hydramnios was due to transfusion of the diabetic mother's blood or urine passed by a diabetic fetus. The latter seemed improbable, for the fetus must have been dead for some time and the hydramnios had appeared only a few days before labor.

A Contribution to the Subject of Gonorrheal Affections of the Mouth in Infants.

Dr. H. Leyden, of Boston (*Centralblatt für Gynäkologie*, February, 1894), reports the following case: An unmarried woman, aged 20 years, was confined January 17, 1894. She had profuse leucorrhea, which she said had appeared during the last months of her pregnancy. Immediately after the birth of the head the child's eyes were washed with 1:7000 corrosive sublimate solution. On the seventh day marked swelling of the right eye appeared with free, yellowish, clear

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discharge. The left eye was unaffected. On the following evening a small yellowish pustule about the size of a pea was found on the inner surface of the upper lip. There were numerous gonococci found in the discharge from the eye and the pustule in the mouth. The swollen upper lip prevented the infant from nursing freely. The mouth was treated by frequent moppings with corrosive sublimate solution 1 : 7000, and in nine days after its appearance all traces of the pustule had disappeared except a little grayish epithelial desquamation. The eye proved more obstinate.

Leyden considers the inoculation during birth improbable. He advances the theory that the infective lochia were transferred on the mother's fingers to the infant's hand, and points out how easy would become the inoculation by the actions of sucking the fingers and rubbing the eye, observed so frequently in newborn infants.

Toxemia and Infections in Pregnancy.

Doria (*Il Policlinico*, March 1, 1895) holds that in the uterus of a gravid woman, between the walls of the uterus and the membrane of the ovum, a morbid process is set up with the productions of lesions upon or in which bacteria belonging to the saprophytic group may develop. These bacteria are usually considered non-pathogenic. Along with this local process a form of toxemia is slowly developed, characterized by hemorrhages. Then follows localization of the bacteria in numerous hemorrhagic and necrotic foci within the spleen and liver. These micro-organisms are identical with those contained in the uterus, and may give rise during life to gas as readily in one part of the body as another. This gas may make its way into the circulation during life and so give rise to some of the symptoms of eclampsia. One of the most constant lesions met with in eclampsia is the presence of small hemorrhagic foci in the liver and spleen. These hemorrhages may be due to the micro-organisms contained in them, or it may only be that the organisms have found a suitable nidus in the focus of dead tissue. The bacteria may produce hemorrhage through their toxines.

Sugar in the Treatment of Uterine Inertia during Labor.

M. Bossi, of Gênes (*Revue Illustrée de Polytechnique Médicale*, May 30, 1894), practically applied the hypothesis of Drs. Paoletti and Mosso, two Italian physicians, that sugar, administered internally, might have stimulating action on uterine muscle as it has on voluntary muscles. Bossi tried it in eleven cases, administering one ounce of sugar in about eight ounces of water. In ten cases the effect was excellent. The ecbolic action showed itself in from twenty-five to forty minutes, and in most cases lasted till the birth of the child. In other cases a second dose had to be given. The uterine contractions were always quiet, regular, and free from any tendency to tetanus.

Typhoid Fever Communicated to the Fetus.

Janisewski (*Presse Médicale*, March 24, 1894) records the case of a woman, eight months pregnant, who was admitted to the hospital with typhoid fever. The diagnosis was confirmed by a bacteriological examination of the stools. Twelve days after her admission she gave birth to a child which lived until it was five days old. At the autopsy no lesions were found except enlargement of the spleen. Cultures, however, from the spleen, intestine, mesenteric glands, kidneys, and lungs produced typical typhoid bacilli.

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THE USE OF COCAINE FOR SUPPRESSION OF THE SECRETION OF MILK.

DR. JOISE, of Lille (*British Gynecological Journal*, November, 1894), has observed that cocaine, when applied to cracked nipples, has the power of diminishing the milk secretion. From this fact he was led to make use of this agent when he desired a complete suppression of milk. He uses a 5-per-cent. solution as follows:

℞ Cocain. hydrochlorat. 5.0
Aquæ destillatæ
Glycerini, āā 50.0

The solution is applied with a soft brush five or six times daily to the nipples. The suppression follows in two to six days. He has never experienced any inconvenience from the use of this drug on account of the small surface to which it is applied. Cocaine, by producing anesthesia of the nipple, prevents its erection, thus favoring, according to Joise, the decrease in the quantity of the milk.

GYNECOLOGY.

UNDER THE CHARGE OF

CHARLES BINGHAM PENROSE, M.D.,

ASSISTED BY

WILLIAM A. CAREY, M.D., AND H. D. BEYEA, M.D.

A CASE OF OBLITERATION OF THE UTERINE CAVITY AFTER CURETTING.

FRITSCH (*Centralblatt für Gynäkologie*, No. 52, 1894) reports the following case: Mrs. X., 25 years of age, after a perfectly normal labor on January 31, 1892, followed by a feverless puerperium, began to have continual hemorrhage, small in amount, from the uterus. A specialist was consulted and curettement advised. This operation was performed on February 24, 1892. The husband of the patient was present at the operation, and said that the curetting was long continued, severe, and that, finally, a portion of flesh, hard in consistency, which could not be crushed between the fingers, was removed. The uterus was tamponned, and after eight days the patient was discharged perfectly well. Since this operation she had not seen her menstrual flow. She consulted the writer because of sterility. She is a woman apparently in perfect health, without the least symptom of hysteria or nervousness, and simply complains of "flashes of heat," symptoms of induced menopause. On examination the vagina was found normal, the cervix small and hard, and the os partially obliterated, only a small opening being found towards the left lateral fornix. The uterus was very small (infantile), and the ovaries and tubes normal. After incising the cervix, the cervical canal was found to be four-fifths of an inch in length, but the smallest instrument could not gain an entrance into the uterine cavity. With a knife and uterine dilators the uterine cavity was opened until a sound could be introduced one and two-fifths inches. This sound could easily be felt at the fundus through the abdominal wall. A laminaria tent was then introduced and allowed to remain twenty-four hours, when the cavity was packed with iodoform gauze. After fourteen days the cavity was

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again obliterated. In October, 1894, the same original condition was found. The patient was still in perfect health. Fritsch remarks that severe curetting during the period of fatty degeneration of the uterus, removing all of the endometrium and tearing the muscle tissue, can easily result in complete obliteration of the uterine cavity, but that it is scarcely possible at any other time.

The Improvement of the Results in Complete Hysterectomy for Carcinoma of the Uterus.

Mackenrodt (*Zeitschrift für Geburtshilfe und Gynäkologie*, Bd. xxix) believes that the operation of complete hysterectomy for carcinoma of the uterus does by no means offer absolute results, that the disease returns in more than half of the cases operated upon. One cause of this unquestionably lies, as shown by the investigation of Winter, in the possibility of the inoculation of healthy tissue from the carcinomatous part; also, and particularly, has the writer concluded from the same investigations that the operation is usually not radical enough. Carcinomatous nodules are very frequently allowed to remain in the broad ligaments, and a necessary result is, that the disease sooner or later returns. Mackenrodt has demonstrated this through the careful examination of a large number of extirpated uteri. The operator, he says, has believed that the incisions were made only in healthy tissue, but the microscopical examination of removed organs show the infiltration extending to the linè of incision. Thus, in order to improve the results of complete removal of the uterus for carcinoma, he believes that more tissue should be removed from the broad ligaments than is the custom. In accomplishing this the injury of the ureters must be carefully avoided. This last is attained by separating the bladder not only from the uterus, but also from the anterior surface of the broad ligaments. The bladder with its attached ureters are thus considerably separated from the uterus and the tissue for a distance of an inch on each side of the cervix can easily be excised. The injury of the ureters after this procedure is scarcely to be considered. The separation of the bladder and ureters from the anterior surface of the broad ligaments can be accomplished quite as well in vaginal as in abdominal hysterectomy. Where there is a rigid vagina, large uterus. and advanced carcinoma, Mackenrodt usually does abdominal hysterectomy.

The Treatment of Dysmenorrhea.

Schwarze (*Therapeutische Monatshefte*, May, 1894) writes upon treatment of the forms of dysmenorrhea which are unassociated with inflammatory disease of the uterus at its appendages, those due to anatomical changes and congenital malformation of the uterus. Therefore that associated with pathological anteflexion, retroflexion in the virgin uterus and the different forms of congenital deformity of the uterus. This class includes stenosis of the external and internal os and all forms of dysmenorrhea in which no anatomical changes can be demonstrated. He believes the following drugs are of use: the preparation of iron, antipyrin, phenacetin, antifebrin, exalgin, and sodium salicylate. In some cases it may be necessary to administer codeine and opium, the dose being small. In young girls and women of apparent good health the Thure-Brandt's method of gymnastics of the entire body is frequently followed by marked benefit. It should particularly be applied for a week preceding each menstrual period. In well-developed and apparently healthy virgins, with severe dysmenorrhea, the writer advises ext. viburnum prunifolium Fl., a teaspoonful three times daily, for five to seven

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days before and during the menstrual period. Usually the Thure-Brandt gymnastics and the viburnum prunifolium treatment are combined. Massage of the uterus does good in those cases where there is an undeveloped or infantile uterus. It should not be employed in young girls. The introduction of a sound into the uterus just before the menstrual period, removing the pathological anteflexion and dilating the canal, is often followed by relief of symptoms. Rapid dilatation of the cervical canal a day before the period is the better method. Electricity applied to the uterus does good in many cases. The negative pole, an aluminium sound, is introduced into the uterine cavity, and the positive pole, a large, flat electrode, is placed upon the abdomen. A faradic current of from 50 to 150 milliampères is employed. Finally, should there be no anatomical lesion and the menstrual period so very painful that life is made unhappy, oöphorectomy should be performed.

Electricity as a Means of Diagnosis in Gynecology.

Houdarf (*Centralblatt für Gynäkologie*, No. 45, 1894) believes that since electricity has been employed to advantage as a method of diagnosis in nervous diseases, it can also be a distinct help in the differential diagnosis of the diseases of the female genital organs. The principle of its application is as follows: That in every instance where the uterus is surrounded by healthy adnexa a continuous current of 100 to 150 or 200 milliampères can be applied without symptoms; that in every instance where there is inflammatory disease there is intolerance to this current, and the application is always followed by pain or fever. The fever always indicates the presence of pus. Other conditions, as nausea, vomiting, headache, syncope, nervousness, and diarrhea have been noticed in a few cases, and are of secondary value in diagnosis. They indicate either adnexa disease or hysteria. In those cases where intolerance is dependent upon nervousness, positive results can be gained by using the faradic current. Houdarf, after reporting the results observed by himself and other investigators in thirty cases, concludes: first, that by the use of electricity, the continuous or faradic current, the diagnosis of pelvic inflammatory disease is made much easier; that, as in every other method of clinical examination, it is not infallible. Second, that by means of the faradic current it is not possible to discover inflammatory disease surrounding the uterus, but ovarian and uterine pain of nervous origin can be isolated. Thus it can be determined whether the pain is due to organic disease or nervousness. Third, that the application of the continuous current of medium intensity (fifty-six milliampères) is followed by no symptoms, or a reaction-pain, or fever. If no reaction follows, it is positive that no inflammatory disease of the uterine adnexa or neighboring organs exist. If pain or fever results, 90 times out of 100, there is present inflammatory disease of the adnexa or in the pelvis. Therefore, where there is intolerance, it is a positive indication for operation; on the other hand, where there is tolerance, operation is not indicated. Fourth, that with antiseptic precautions electrical examination is without danger. The contraindications for its employment are pregnancy and acute peritonitis.

Vaginal Hysterectomy for Prolapse of the Uterus.

Quénu (*Gazette Médicale de Paris*, No. 51, 1893), in reviewing the literature, finds that this operation was first performed for prolapse of the uterus only where sloughing and gangrene had taken place. Later, the indication was where the patient is beyond the menopause and the prolapse complete. Before the meno-

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pause ventro-fixation was advised. Quénu does this operation on women who are between 50 and 55 years of age, where the prolapse is associated with urinary symptoms, difficulty in locomotion, lumbar pain, and digestive symptoms. His results have been very satisfactory. In the operation the ligaments are sutured together and to the vagina, so that they act as ligaments to the vagina.

In the discussion of the writer's paper (*Gazette Médicale de Paris*, No. 1, 1894) Ségond advises that hysterectomy should be performed only when the supporting apparatus or disease of the surrounding structures cause the prolapse, as follows: First, when disease of the uterus demands operation,—*i.e.*, when it contains a fibroid tumor; second, where associated with adnexa disease; third, neoplasms of the adnexa which are causing the prolapse; fourth, where replacement is impossible; fifth, where many operations would be necessary in women over 50 years of age. He employs the clamp method of operation. Richelot formulates his opinion as follows: First, that colporrhaphy is very advantageous; second, that vaginal fixation is illusionary; third, that hysterectomy should particularly be performed in women who have passed the menopause. If the prolapse is associated with disease which demands operation, hysterectomy should be the one performed. When there is prolapse alone and the uterus small, colporrhaphy is the best operation, and this associated with amputation of the cervix when the uterus is large. Where prolapse has returned, he advises colporrhaphy and ventro-fixation. Where hysterectomy is done in this last instance, he believes it advisable to do colporrhaphy. Lucas-Championnèire has performed hysterectomy in eight cases where the prolapse has returned after operation. He recommends associating the hysterectomy with colporrhaphy, and that the operations should be performed in separate sittings. Schwartz and Reclus also advise the last. Routier has given up the operation.

PATHOLOGY.

UNDER THE CHARGE OF

JOHN GUITÉRAS, M.D.,

ASSISTED BY

JOSEPH McFARLAND, M.D.

A Detailed Report of some Experiments in the Production of the Diphtheria Antitoxin.

A. P. Ohlmacher (*Medical News*, March 16, 1895), in a rather voluminous report, gives the entire process by which he accomplished the manufacture of the "antitoxin." The originality in Dr. Ohlmacher's paper includes the rejection of the special flasks for growing the toxines; abolishing the current of air suggested by Fernbach; and ceasing to attempt to increase the virulence of the bacillus by artificial culture means.

In cultivating the bacillus the flasks are agitated once daily so as to distribute the bacilli which tend to settle at the bottom of the flask. The cultures grow for two to three weeks, are trikresolized, and then filtered. Light was not found to change the toxines. The one horse upon which the observations are based was im-

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munized in a very short time. The first injection of 0.5 cubic centimetre was given December 20, 1894, the last dose of 250 cubic centimetres February 5, 1895, —forty-seven days in all. Eleven injections were given.

The blood was not taken with a trocar, but a careful dissection was made, two inches of the jugular vein exposed, a snip made into it with scissors, and the blood caught as it flowed from the opening made to gape with a dull hook.

One per cent. of sodium salicylate is most strongly recommended instead of camphor, phenol, or trikresol as a preservative for the serum.

The points upon which emphasis is laid are as follows:

(1) The necessity of obtaining a pure culture of a highly virulent diphtheria bacillus.

(2) The fact that the toxines may be made by simply growing the bouillon cultures . . . in the incubator (in ordinary flasks) for two or three weeks, then adding ½ per cent. of trikresol and filtering.

(3) The secret of a highly potent toxine lying in the virulent characters of the organism employed.

(4) The fact that the immunizing injections in the horse can be pushed more rapidly than is usually done.

(5) The fact that a number of small vesselfuls of blood will yield more serum than a single large vesselful.

(6) The advantages of sodium salicylate as a preservative agent (1 per cent. is added to the serum) for the diphtheria antitoxin.

Tetanus Antitoxin; its Preparation and Properties.

Hewlett (*British Medical Journal*, March 2, 1895, p. 464) gives the following method: The cultures are made in "yeast flasks" of about 120 cubic centimetres' capacity, with a narrow glass tube attached to the neck, for the first inch or so passing horizontally outward, then bent downward at right angles. The neck of the flask is corked with a perforated rubber cork, through which a narrow glass tube passes to the bottom of the flask, projecting two inches above the cork. This projecting portion is loosely plugged with cotton. The flasks are filled with grape-sugar bouillon, sterilized, and inoculated after momentarily withdrawing the rubber cork and tube. The air is expelled from the flask and replaced by hydrogen by connecting the projecting glass tube with a Kipp apparatus. The gas bubbles through the bouillon and escapes from the side tube. After hydrogen has passed through for half an hour, a small capsule containing mercury is applied to the free end of the lateral tube so that its free end just dips beneath the surface of the mercury. The projecting end of the tube which passes through the rubber cork is then sealed off in the blow-pipe flame. The flask is thus filled with hydrogen which cannot escape, nor can air enter on account of the mercurial valve, though if any gas be formed during the growth of the organism it can escape, while the flask can be used again and again. The flask with the mercurial valve *in situ* is placed in an incubator at 37° C. After the lapse of two days the bouillon becomes turbid, and gradually a small precipitate, consisting chiefly of bacilli and spores, falls to the bottom. A surface film never forms. The culture can be used after it has been grown for three weeks, but preferably for a month. After five weeks' growth the virulence seems to diminish. Such a culture is so toxic that after filtration $\frac{1}{100}$ cubic centimetre is sufficient to kill a guinea-pig weighing 300 to 400 grammes. The cultures are filtered and an antiseptic (0.5 per cent. carbolic acid) is added to prevent subsequent putrefactive changes.

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The filtered culture will keep indefinitely in a cool place.

For the immunization of the horse, which is the animal preferred, the toxine is in the beginning mixed with an equal volume of Gram's solution, this being gradually decreased as the toxine is increased in amount. The beginning dose is 0.5 cubic centimetre, and is gradually increased to 90 cubic centimetres. Such an increase took from May to December, three injections being given weekly to the horse the writer observed. When the blood was drawn it was found to have an antitoxic power of 1,000,000.

The horse is bled from the jugular vein, the blood allowed to coagulate, then the clear serum pipetted off. As this serum may have to be kept indefinitely, it is preferred to dry it *in vacuo* over sulphuric acid. Heat cannot be employed as it changes the antitoxin. The serum yields 9 to 11 per cent. of dry antitoxin, which can be finely powdered, and when needed can be diluted with 5 to 10 cubic centimetres of distilled water. The dose is from one to four grammes of the dry substance.

A Psammo-Carcinoma of the Female Breast.

Neugebauer (*Langenbeck's Archiv*, Band xlviii, 1894) reports an adenocarcinoma of the breast, in which the epithelium was of the columnar type, but in which and in the secondary axillary tumors derived from it the appearance of concentric masses of carbonate of lime occurred. These masses were without epithelial covering. The only other organ in which such a tumor has been reported is the ovary.

The Communicability of Carcinoma.

Geissler (*Langenbeck's Archiv*, Band xlvi, 1893), following the idea of Adamkiwicz that carcinoma was specific in its action upon the nervous system, inoculated twenty-five rabbits with fragments of perfectly fresh tissue. The fragments of tissue were introduced under the most thorough antiseptic precautions into the brains of the animals, but never produced any other change than mechanical irritation. They remained *in situ* longer than if introduced into the peritoneal cavity, but no development of the epithelial constituents was ever observed.

The Rapid Diagnosis of Glanders by the Method of Straus.

Levy and Steinmetz (*Berliner klinische Wochenschrift*, 1895, No. 11) report an interesting case in which Straus's method for detecting glanders was in error. The patient suffered from typhoid, and had upon the hand an angry ulcer caused by the bite of a horse. It was thought to be due to glanders, and the Straus test was employed. Some of the pus was scraped off, diluted, and injected into the abdominal cavity of a male guinea-pig. In three days the orchitis began, was typical in its course, and was followed by the death of the animal with general symptoms in eight days. When the pus contained in the suppurative areas of the testicle was examined, not a trace of a glanders bacillus could be found, nothing being discovered, but the staphylococcus pyogenes aureus was present.

The writers explain that the seminal vesicles in the animal were very long; that the injection into the abdominal cavity was made as low down as possible; and that the injection may have caused the orchitis by the injection of staphylococci into the seminal vesicle.

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CORRESPONDENCE.

VAN WERT, Ohio, March 11, 1895.

DR. BARTON COOKE HIRST.

Dear Sir: Having seen in the last UNIVERSITY MEDICAL MAGAZINE a few lines about the heavy weight of new-born children, I will report a case which may be of interest, owing to the large size of the child and the proportion of child's weight to its mother.

While practising in Chicago, I was called on March 17, 1891, to assist a midwife in delivering a Swedish woman. She was a V-para, aged 37 years, and weighed usually about 110 pounds. I applied forceps and brought the head well down on the perineum and allowed nature to expel the child. A male child, weighing fourteen pounds (naked), was born without lacerating the perineum. The proportion of the child's weight to that of the mother was 1 to 8. The mother was up and around in the usual length of time.

Yours very truly,

DR. A. BERTRAM GILLILAND (U. of P. '90).

BOOK NOTICES.

ASEPTIC SURGICAL TECHNIQUE, WITH ESPECIAL REFERENCE TO GYNECOLOGICAL OPERATIONS. BY HUNTER ROBB, M.D., Associate in Gynecology, Johns Hopkins Hospital, Professor of Gynecology, Western Reserve University, Cleveland, Ohio. Philadelphia: J. B. Lippincott Co., 1894.

This is one of the best books which we have recently read. The experience which Dr. Robb has had in the practical application of the subject of this book, the many contributions which he has made in surgical bacteriology and aseptic technique claim for him the attention of all physicians interested in modern surgery. The book is in no way disappointing; one feels after reading it that he has learned facts of practical value, or at least that his previous knowledge of aseptic surgical technique gathered from many scattered sources has been systematized and defined, and is, therefore, more valuable for practical use. Enough facts in bacteriology are given to engage the interest and to enable the reader to understand the reasons for the details of the technique which are described.

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He who is familiar with the contents of this book will be most thoroughly equipped in all the theoretical and practical details of modern aseptic surgery. We consider it most valuable in the hands of the nurse, the student, and the practitioner.

A SYNOPSIS OF THE PRACTICE OF MEDICINE. BY WILLIAM BLAIR STEWART, A.M., M.D. New York: E. B. Treat, 1894.

The extension of the course of study in most medical schools does not seem to have diminished the demand for compends and manuals. The average student makes a distinction between reading and studying; he reads from text-books and studies from compends. He derives information from both sources, but from the latter he especially acquires the information that will carry him through the crisis of an examination, and probably as long as the present tests of attainment are in vogue, so long will there be a demand for manuals and compends. If such books are to form a part of the students' armamentarium, it is very important that they should be of high standard; they must emphasize principles, they must present the essential facts concisely, and in a logical sequence, and above all, they must be absolutely accurate.

Dr. Stewart's compilation is fairly complete, it is very concise, but it is far from logical in its arrangement, and it is scarcely accurate in all of its statements. Thus, we are told that succussion splash is heard in hydrothorax, that the *bacillus malariæ* is the exciting cause of malaria, and that the dicrotic pulse has the same characteristics as the water-hammer pulse.

The two statements under the treatment of atonic dyspepsia—"Forbid spices or condiments," and "No remedy will settle nerves and restore the equilibrium better than capsicum,"—are scarcely consistent. Typhlitis and perityphlitis are allotted two pages, while all that we learn of appendicitis is that the inflammation of the cecum may involve the appendix vermiformis. The prognosis in these cases—"Last one week or more, and usually recover"—is difficult to reconcile with our preconceived ideas of perforation and collapse to which the author refers. In the chapter on convulsions the relation between Jacksonian epilepsy and organic brain disease is not intimated, and the student is directed to treat minor and Jacksonian epilepsy on the same general plan as epilepsy major. Most examiners would be loath to accept the description of the Brand method of treating fevers given by the author on page 23.

Faults of omission are also quite numerous; no reference is made to the ameba coli in dysentery, to venesection in thermic fever, and to enteroclysis in the summer diarrhea of childhood. Myxedema and lithemia are not even mentioned, and ulcerative endocarditis is dismissed with a half a dozen lines, while more than a page is wasted on tuberculin.

It must, unfortunately, be said of this manual that it presents the subject, in the hackneyed way common to many works of its class, that it contains many inaccuracies and omissions, and that it is difficult to find sufficient justification for its appearance.

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BLOOD-SERUM THERAPY AND ANTITOXINS. BY GEORGE E. KRIEGER, M D., Surgeon to the Chicago Hospital, etc. Chicago: E. H. Colegrove & Co., 1895.

In this little volume the author gives an interesting and accurate idea of the theory and practice of serum therapy with special reference to diphtheria. There is no pretended originality, the style is German, there are occasional inaccuracies, but the little work is useful for the "busy doctor" who desires to obtain without extended research a definite knowledge of the now important subjects comprehended in the title.

TRAVAUX D'ÉLECTROTHÉRAPIE GYNÉCOLOGIQUE. BY DR. G. APOSTOLI. Vol. I. Paris: 1894.

The use of electricity in gynécologic conditions has been, and still is, subjected to adverse criticism by the gynecologic surgeon, and especially is this so in its application to the removal of fibroid tumors of the uterus. Many regard the effect of electricity in these cases as of doubtful value, and by all surgeons the attempt at removal of uterine fibroids by electricpunctures is considered not only vain but highly-fraught with danger to life. In the minor gynecologic conditions the, use of electricity can at least do no harm, while in those scores of cases which consult the gynecologist for vague pelvic pain with no appreciable lesion its use may do great good.

This book is a collection of the more important papers dealing with electricity in its relation to gynecology, translated into the French language, with added foot-notes by Apostoli and his co-editors. Volume I contains papers from the English, Belgian, Danish, Austrian, Polish, Hungarian, and Canadian literature. To those interested in electricity, the French translation of these papers will be of great value. The publication will appear half yearly.

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UNIVERSITY
MEDICAL MAGAZINE.

JUNE, 1895.

THE OPERATIVE TREATMENT OF FRACTURE OF THE PATELLA.

By J. William White, M.D.,

Professor of Clinical Surgery, University of Pennsylvania; Surgeon to the University and German Hospitals, Philadelphia.

The important questions to be considered in regard to the treatment of fracture of the patella are as follows:

(1) Are the results obtained by the ordinary methods of treatment satisfactory?

(2) If not, what are the causes of failure?

(3) Is there no method less radical than that of opening the joint and wiring the fragments which will be equally effective?

As to the results obtained by the use of splints, plaster dressings, etc., every surgeon is familiar with the disability accompanying ligamentous union in cases of transverse fracture of the patella, and it is safe to say that bony union is one of the rarest occurrences after such an injury. The patient, with a fibrous band of an inch or more in length interposed between the upper and lower segments of his patella, will have a gait which is peculiar and unmistakable. He cannot bring forward the foot without flexing the knee; he cannot go down-stairs without placing both feet on the same step at the same time, on account of his inability to maintain the leg of the injured side with any certainty in the line of the thigh. If he is in the supine position he cannot lift the limb while holding the leg in full extension. In addition, there is a feeling of uncertainty in standing and walking, frequent and recurrent hydrops articuli, atrophy of the quadriceps femoris, often more or less joint-pain, in many cases the necessity for a brace or knee-cap, and other minor inconveniences. Refracture is not uncommon,

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and in the very best cases convalescence is tedious and protracted. These conditions are not exaggerated. While Malgaigne states that he has never seen the function of the limb completely restored even when the separation was limited to one-third of an inch, Dennis asserts that, after a careful analysis of a large number of cases treated by the older methods, he has found that a separation of the fragments amounting to half an inch is considered a most favorable result.

It is evident, without further argument, that, as compared with this condition, a close bony union of the fragments is greatly to be desired. Mr. Henry Morris has, to be sure, called attention to the fact that in cases where the fibrous band is very short and firm there is practically no weakening of the joint, and that in such cases, when refracture occurs, it is the bone and not the ligamentous band that breaks. Even admitting these statements as correct, I am convinced, after an independent investigation of the subject, that such results as Mr. Morris describes are extremely rare, and cannot be confidently expected in more than 5 per cent. of ordinary cases.

The alleged causes of failure to procure better results by ordinary methods may be divided into three classes.

(*a*) Lister believed that non-union was usually due to two factors: the separation of the fragments by the contraction of the quadriceps muscle, and the presence of accumulated fluid within the joint. (*b*) von Bergmann thinks that the atrophy of the quadriceps, due to the pressure of the dressings employed and to disuse, is progressive, and believes that this condition is responsible for a large proportion of the cases in which it is impossible to extend the limb. (*c*) Macewen believes that the chief cause of non-osseous union is the interposition of fibrous and aponeurotic structures between the fractured surfaces, and that, before such union can be obtained, it is requisite in the first instance to elevate all the tissues which lie over the fractured surfaces and which prevent them from coming into intimate contact. In explanation of this view he details cases in which he has found portions of the soft parts lying between the fragments, either forced there by the vulnerating body in cases of direct injury, or driven in by atmospheric pressure when the fracture is the result of muscular violence. In such cases the fibrous and aponeurotic structures being more elastic than bone, the latter breaks first and then contracts, while the soft parts stretch, give way, and are then forced in between the fragments by the pressure of the outside air. Macewen's observations have been corroborated by Hardy, Laylard, and others. Fowler, of New York, reported a case in which he found irregular, shreddy fibres of the soft tissues at the upper edge of the rent intimately adherent to the projecting spiculæ of the roughened fractured surface of the upper

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fragment. Sir Joseph Lister has recently told me that, in his own cases of fractured patella, he had frequently found it necessary to elevate such portions of the soft tissues from between the fragments, and he expressed a general acquiescence in the view which attributes to them the chief importance in the production of ununited fracture.

It is safe to say that the above-named causes include all the chief factors which tend to produce non-union; but much depends upon the relative importance which is assigned to them. It is self-evident that continued separation of the fragments must prevent union by bone. It is almost equally probable that a large unabsorbed or organized effusion of bloody synovia will have the same effect. Atrophy of the quadriceps will, of course, and necessarily, interfere with the further use of the limb, and would serve to increase the disability apparently due to the want of bony union. As to the influence of fragments of soft parts interposed between the bones, while it might seem, on *a priori* grounds, to be the least potent factor of the three, as absorption and disappearance of soft and living tissues under such circumstances might reasonably be expected, the clinical facts appear to demonstrate that it is the real cause of non-union in most cases.

I used to think that if Macewen's explanation were the correct one, and the interposition of the prepatellar fibrous structures were the chief causes of non-union, the only rational method of procuring bony union was by cutting down and elevating these fragments of the soft parts. The other indications could be met by much simpler and safer methods of treatment. The exudation in the joint can be removed by aspiration. The fragments can be brought together and held in position by bandages, or by Malgaigne's hooks, as in a case I operated on in 1888. Indeed, immediate aspiration of the joint and the aseptic application of Malgaigne's hooks covered by sterilized or aseptic dressings, together with the use of a posterior splint and a light, moderately firm bandage, would seem to meet every indication except the one which has been mentioned. The use of the hooks enables us to dispense with the excessive pressure by bandages or otherwise required to keep the fragments in apposition. It certainly approximates them more nearly and accurately than does any other method I have ever seen, with the exception of wiring or suturing. It combines all the advantages of the old methods by splints and plaster with a greater degree of accuracy in bringing and holding the fragments together. There should be scarcely more risk of septic infection than in an ordinarily subcutaneous tenotomy, provided care as to aseptic precautions be taken at the time the hooks are introduced. If Macewen had been mistaken in assigning to the influence of the presence of the prepa-

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tellar structures the majority of cases of non-union, the aseptic use of Malgaigne's hooks would in my judgment be the most rational method of treating transverse fracture of the patella. But in 1891 Mr. Barker, of London, described an operation which I soon after adopted and have since employed in a considerable number of cases. I have not invariably succeeded in getting bony union, but have done so in the great majority of the cases, and have never had any extensive separation of the fragments. My average results as to shortening the time of treatment and as to the functional usefulness of the joint later have been far superior to any I had obtained before adopting this method. The patients have never had the least after-trouble, and in no case has there been suppuration, or fever, or even marked pain. It is only fair to say that I know of cases in other hands in which septic arthritis has followed the same operation, and the patients barely escaped with their lives.

It must, of course, be admitted that this is among the possibilities, but it ought to be avoidable, and I have thus far found it so. The operation is easy and simple, and can be done in a very few minutes. The lower fragment of the patella is steadied by the finger and thumb, and a narrow-bladed knife thrust into the joint, edge upward, in the middle line of the ligamentum patellæ at its attachment to the lower fragment. Through the wound thus made a stout-handled pedicle-needle is thrust into the joint behind the lower fragment, and pushed up behind the upper fragment and through the quadriceps tendon in the middle line as close to the border of the bone as possible, the upper fragment at this time being forced down and steadied. When the point of the needle becomes apparent beneath the skin the latter is drawn upward and an incision made upon the needle, the eye of which is then threaded with sterilized silk and the needle withdrawn, carrying the thread behind the fragments. The needle is next unthreaded and passed through the same skin wound below and out of the upper wound, but this time in front of and close to both fragments. Here it is threaded with the upper end of the suture and withdrawn. The two fragments are then brought together, friction is made to displace clots or other foreign material, and the ligature tied tightly over the lower border of the patella. The two ends of the ligature are cut short and the wound closed. A posterior splint and figure-of-eight bandage are applied. Passive motion may be begun on the tenth day. The patient may get out of bed wearing a light plaster bandage at the end of the third week. Good use of the joint may be expected in from eight to ten weeks or earlier.

In estimating the comparative value of the different methods, it is needless to say that the danger to life should exert a predominant influ-

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ence. This danger is undoubtedly greater by the method of wiring than by any other plan of treatment. And it is this fact which causes careful surgeons to hesitate to-day in recommending its employment. Of the 186 cases included in a table compiled by Dennis a few years ago there were 34 cases of suppuration, 4 amputations, 24 cases in which the result was said to be "poor" (14 of them were said to have resulted in complete anchylosis), and there were eleven cases which terminated fatally. Of the remainder, 35 were marked as ending with a "fair" result, 17 of them having incomplete or partial anchylosis. Lister himself has told us that before he made the incision in the first case of wiring which he ever performed, he remarked to those sitting around him in the amphitheatre that he considered no man justified in performing such an operation unless he could say with a clear conscience that he considered himself morally certain of avoiding the entrance of any septic mischief into the wound.

The opposition at this time (November, 1883) was very strong, and such surgeons as Mr. Bryant, Mr. Adams, Mr. Sydney Jones, Mr. Henry Morris, Mr. Edmund Owen, and Mr. Grant placed themselves on record as opposed to the operation, believing that the bulk of simple fractures do well enough without it, Mr. Christopher Heath going so far as to remark that he thought Mr. Lister's paper would cost many knees and many lives. As recently as August, 1887, we find that Messrs. Barker, Thompson, Stoker, and Robson were equally opposed to the indiscriminate performance of the operation. The strength of the feeling against the operation, only a few years ago, is well shown by the following conclusions reached editorially by the London *Lancet*, after a full consideration of the subject. They were:

(1) That the operation is not suitable as a primary measure.

(2) That in view of all its dangers and of the good results obtained by other and perfectly safe methods of treatment, it is not commendable for general employment.

(3) It is not justifiable unless with most absolute asepsis.

The French Academy of Surgery pronounced against it with almost equal force, and the most recent writers on fractures and dislocations have freely agreed with Pick, who says that he would not permit the operation to be done upon himself, and therefore cannot recommend it to his patients.

Mr. Howard Marsh[1] says, that the prevailing opinion in regard to this operation is that in cases of recent fracture it is uncalled for, while in many cases of old fracture it is impossible to carry it out in a satisfactory manner. He adds that he cannot recommend Malgaigne's

[1] "Fracture of the Patella," Heath's Dictionary of Practical Surgery.

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hooks, as their use has been followed by diffuse inflammation around the patella, and even by suppuration of the knee-joint, ending in some cases fatally, in others in anchylosis, and because, although they draw the fragments more closely together than any other method except wiring, they do not by any means insure bony union. It is obvious that a few years ago at least some other method than open incision and wiring was needed to satisfy the majority of the profession, who preferred the imperfect results obtained by splints and bandages to the risks of operation. I believe that with proper care the procedure I have here described—Barker's operation—meets the indications, and with a reasonable degree of safety gives far better results. Other methods have been devised to reach the same end.

Fowler[1] has recently reviewed this subject in a paper read before the New York Surgical Society, and proposed an operation which differs in some of its details from the other procedures described. In his preliminary remarks he makes a distinction between the fractures occurring as a result of muscular action, in which the fibrous structures in front of the joint are driven by atmospheric pressure between the fragments (as Macewen long ago demonstrated), and fracture occurring as a result of direct violence, in which he apparently does not believe that this interposition of the aponeurotic tissues occurs.

In the latter cases he does not advise operation, and seems to expect bony union. I do not believe either that the difference between the two conditions is so frequent as to offer a reliable basis for different plans of treatment, or that bony union is likely to follow in the majority of such cases.

In the former class—fracture from muscular action—he recommends a delay of two or three weeks to permit of the subsidence of the effects of the traumatism upon the surrounding structures, as well as the closure of a possible rupture of the upper recess of the capsule, which according to Riedel is frequently opened and permits of infection of the soft parts of the front of the thigh. He then by a U-shaped flap exposes the line of fracture, dissects out the intervening fibrous tissue, fastens the bone with fixation hooks and closes the wound. The hooks are allowed to remain about three weeks. He claims for this method the following advantages.

(1) The parts to be operated upon are in better condition, both as regards vital resistance and asepsis than when the primary operation is done.

(2) There is the minimal exposure of the joint surfaces and disturbance of the fragments.

(3) The operation can be done in a remarkably short space of time, hence less risk is taken both as to sepsis and the anesthetic.

[1] Annals of Surgery, June, 1895.

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(4) No foreign suture material is left in the bone to produce caries, or to demand subsequent reopening of the wound and removal.

(5) The hooks may be removed, and if the union is not found to be complete or firm, they may be reapplied.

If my experience with Barker's method had been either less extensive or less satisfactory I would be disposed to consider this, but I can see no present reason for doing so.

In the discussion which followed the reading of Dr. Fowler's paper, Dr. Stimson, Dr. Bryant, Dr. Abbe, and Dr. Lilienthal expressed in a general way disapproval of operative treatment except in the hands of hospital surgeons of large experience, and the last three a preference for the non-operative methods in most cases.

Ceci[1] describes a method consisting of a subcutaneous buried suture which surrounds the patella, and passes through the tendons above and below it close to its margin. He believes that this plan of treatment has the following advantages: The general applicability of the suture, no matter how great the comminution of the patella; the mechanical union of the fragments, independent of new bone-formation, and affording sufficient and permanent resistance to the disjunctive forces; the subcutaneous character of the entire operation, permitting of rapid and thorough repair of the superficial and deep soft parts, completed in his cases in from four to eight days; the removal of the splints as early as the end of the first week, after which the joint requires neither immobilization nor compression. The practical advantages of the method he thinks may also be seen when it is studied in its relation to the causes of non-union. If, for example, union does not take place, on account of blood or synovial exudation, puncture of the joint or aspiration is not required, as the exudation will escape through the openings made to admit the suture, and this emptying the joint can be facilitated by the employment of gentle massage. Atrophy of the quadriceps is to a great extent avoided, by the very early period at which passive motion or even active movement can be permitted. If union is prevented by the interposition of fibrous bands, the subcutaneous wire suture is sufficiently strong to hold the fragments together.

In several of his cases, months afterwards, the wires could be felt plainly through the skin and gave rise to no trouble or inconvenience of any sort. The operation appears to bear a close resemblance to that of Volkmann, who employed a silk suture passing out through the quadriceps tendon and through the tendo-patellæ; and to that of Kocher, who passed a silk thread above and below the fragments by

[1] Deutsche Zeitschrift für Chirurgie, February, 1888.

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means of a transverse or longitudinal incision. König has done a similar operation, employing catgut. Stimson has also employed a particular suture after the manner of Ceci.

But all of these methods are, in my opinion, theoretically inferior to that of Barker, which for ease and celerity of performance, and thoroughly satisfactory results, is, I believe, to-day the operation of choice. I present three patients this evening, one operated on eighteen months ago for Dr. Taylor, of Beverly, one eleven months ago for Dr. Gerhard, of Bryn Mawr, and one eleven weeks ago at the University Hospital in the presence of the class. They all have either absolute bony union or such close fibrous union that no motion between the fragments can be demonstrated. There is often much difference of opinion between surgeons as to the presence or absence of very slight degrees of mobility. But, although I think that in each of these cases firm bony union is demonstrable, it is after all a matter of secondary importance. They all have, as you see, the most complete use of the joint. The two oldest have tested it in their daily work in every imaginable way. If the union is fibrous, it has not lengthened the smallest fraction of an inch in all this time, and whether it is or not becomes a question of pathological interest, but scarcely important from the stand-point of practical surgery.

LACERATION OF THE CERVIX UTERI.[1]

By Charles B. Penrose, M.D., Ph.D.,

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Gentlemen: In presenting this paper on laceration of the cervix uteri to you, I do not wish to enter upon an exhaustive discussion of the whole subject of laceration of the cervix, but to consider only practical points, which, after a large experience with this disease, I have found are not generally recognized by the medical profession. Sufficient importance is not attached to laceration of the cervix uteri as a cause of suffering in women. A large number, I think, perhaps the majority, of the women upon whom I operate for laceration of the cervix tell me that they had been previously advised by one or more physicians that there was no uterine disease which required operative treatment. Or, they very frequently tell me that they have been told that there was an ulcer of the neck of the womb, which could be cured by local applications and vaginal douches. For these raw-looking surfaces are still generally called ulcers, notwithstanding the fact that

[1] Read before the Clearfield County Medical Society, April 29, 1895.

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Emmet has been teaching the true cause of this so-called ulceration since 1869, and that Ruge and Veit and many others have shown their true pathology; that the apparently raw surface is covered with epithelium, and is in no sense an ulceration.

Emmet tells us that at least one-half the ailments among those who have borne children are to be attributed to lacerations of the cervix uteri. What are the most important of these ailments?

The usual form of laceration which we see is a bilateral tear which results in a separation or a rolling out or an eversion of the anterior and posterior lips of the cervix. The cervical mucous membrane is no longer contained within a closed canal where it is protected. It is exposed to friction and pressure against the posterior vaginal wall at all times, but most when the woman is on her feet and the heavy uterus sinks towards the floor of the pelvis. Being a true mucous membrane, the lining of the cervical canal does not become hardened or toughened by such exposure. After the lapse of years it may become converted into cicatricial tissue, but until that time it is a constantly irritated surface, just as a prolapsed mucous membrane of the rectum or an ectropion of the conjunctiva.

The mucous membrane also proliferates, extending beyond its normal limit at what had been the external os until it may occupy an area one or two inches in diameter, presenting the appearance so erroneously described as an ulceration.

The rolling out of the lips of the cervix obstructs the circulation at the base of the lips in the neighborhood of the internal os; continuous passive congestion results in hypertrophy of the cervical tissues, and the cystic changes we are all familiar with. The large number of racimose glands of the cervix become inflamed; they proliferate, the orifices of the ducts become occluded, so that in extreme cases the whole hypertrophied cervix becomes a mass of cysts, varying in size from a mustard seed to a pea.

So much for the cervix, now for the uterus. Laceration of the cervix takes place in a uterus enlarged by pregnancy, and for this reason lesions occur which would not occur if a simple bilateral incision were made in the cervix of a non-pregnant woman. Subinvolution follows, and the lesions are those incident to subinvolution: endometritis, retrodisplacement, and general pelvic congestion.

Finally, let me mention as not insignificant results of the continuous irritation from the split in the cervix, from the erosion, and the fissure at the angle, involvement of the pelvic lymphatics, the pelvic lymphangitis and lymphadenitis. None of us will underrate the suffering, the disability accompanying this condition when we recall the lameness accompanying an inguinal lymphadenitis, due to

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such a small cause as a minute sore upon the penis or an irritated corn. Similar lameness is caused by the pelvic pain resulting from a lymphadenitis excited by a fissure or an irritated surface upon the neck of the uterus.

Admitting all these lesions as results of the laceration, what symptoms would we expect to find produced by them? Backache, sideache, headache, leucorrhea, menorrhagia, neuralgia in any part of the body, and reflex nervous symptoms caused by the pelvic focus of irritation, constantly nagging and exhausting nervous energy.

We recognize similar reflex disturbances and acknowledge the cause in the case of such an irritating lesion as a fissure of the anus, while some of us are slow to admit that such disturbances may be caused by an irritating lesion of greater physical dimensions in the neck of the uterus. All of the symptoms described, in various degrees and combinations, accompany laceration of the cervix uteri of even small magnitude, and these symptoms are due primarily to the laceration. The proof of this is within the reach of all of us, for the proper repair of the injury in suitably selected cases will relieve the woman of all suffering. This brings me to the consideration of the cases suitable for operative treatment and the methods of operating. There are three kinds of laceration to which I shall call your attention. These are the bilateral, the incomplete, and the combined bilateral and incomplete.

The bilateral laceration of the cervix uteri can only be properly recognized by the finger or by inspection after the vagina has been opened by the Sims speculum. The bivalve speculum masks the lesion. If the examiner keeps before his mind the conical or dome shape of the normal cervix, he will usually recognize a laceration by a digital examination. The vaginal finger comes in contact with the broad face of the cervix, the centre of which is occupied by what appears to be the external os, but what really is a part of the cervical canal some distance above the external os. The finger then glided posteriorly over the broad cervix passes around a corner, either rounded or sharp, and enters the posterior vaginal fornix. If passed anteriorly it enters similarly the anterior vaginal fornix. The presence of this corner or edge is indicative of a bilateral laceration. It is never felt as the finger is passed over the normal conical cervix. In some cases of bilateral laceration it exists in a very marked degree, and it can be rolled in by the finger introduced in the posterior vaginal fornix. In other cases it becomes rounded by swelling of the cervix, and the condition of two gaping and rolled out lips is not so strongly marked. In these cases, however, the cervix feels flat and broad, and is in no sense conical or dome-like, as in the normal condition.

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The condition is still more readily recognized if the woman is placed in the Sims position or the knee-chest position, and the cervix is exposed by retracting the perineum with the Sims speculum. If, then, the anterior and posterior lips are caught with tenacula and drawn towards each other, the apparent ulceration or erosion disappears and the normal shape of the cervix is produced. In any case of doubt this test will make plain the character of the lesion.

You are all probably familiar with the nature of what has been called incomplete laceration of the cervix; but I venture to direct your attention to it because its existence is so often overlooked. In incomplete laceration the structures of the cervix are split unilaterally, or bilaterally to, but not through, the mucous membrane of the vaginal aspect of the cervix. The two lips of the cervix are then held together, and gaping is prevented by this membrane alone. The split may extend from the internal to the external os, converting the cervical canal from a cylindrical or slightly spindle-shaped structure into a cavity as broad as the transverse diameter of the cervix. This condition can readily be recognized by passing a sound into the cervix and directing the point towards either side of the cervical canal, when it will be found that it comes directly in contact with the mucous membrane of the vaginal aspect of the cervix. This condition of simple incomplete laceration is not very common. I mention it because it is so often overlooked. The combined condition, however, of a complete bilateral split of the lower part of the cervix with an incomplete laceration of the upper part is one which I have found not unusual, though I have never seen it described. In this condition the eversion or rolling out of the lips of the cervix is not very marked, because they are held together above by the intact mucous membrane of the vaginal aspect. There are present an erosion, a patulous os, a profuse leucorrhea, and other symptoms of laceration more marked than one would expect from the visible lesion. The detection of the incomplete part of the laceration is readily made with the sound. In operating for slight bilateral tears of the cervix one will often discover this condition of incomplete laceration in the upper portion of the canal if the excision of tissue is carried well up towards the internal os. It will then be found that almost as high as the internal os the anterior and posterior lips of the cervix are only held together by the mucous membrane of the vaginal aspect of the cervix. The recognition of this condition and its operative repair are essential to the success of any treatment. Success in treating laceration of the cervix uteri depends upon the following three factors:

(1) Proper selection of cases.

(2) Preparation for operation.

(3) Attention to certain essential operative details.

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The selection of cases is most important. In many cases of laceration of the cervix uteri the operation of trachelorrhaphy is contra-indicated. It not only will not cure the woman, but it may kill her. Failure to recognize the contra-indications has resulted in a great deal of harm, and has done much to bring discredit upon the operative treatment of laceration. The chief contra-indication to operation is the presence of pelvic inflammatory trouble outside of the uterus, the presence of disease of the tubes and ovaries. Emmet recognized this contra-indication before the days of our modern pathology of pelvic diseases, when he advised preparatory treatment with hot douches and vaginal applications until all symptoms of "pelvic cellulitis," indicated by lateral tenderness and fulness, had disappeared. Marked disease of the Fallopian tubes may in general be considered a contra-indication to the operation of trachelorrhaphy; or at least a contra-indication to the operation of trachelorrhaphy alone, uncombined with salpingo-oöphorectomy.

The presence of a pyosalpinx exposes the woman to a very obvious danger, the danger of an acute attack of pelvic inflammation if the uterus is subjected to the traumatism and manipulation incident to trachelorrhaphy. Most of the deaths after the operation of trachelorrhaphy are due to this cause, and we should not only never have a death after this operation, but the convalescence should be easy and painless. If a woman suffers with local or general peritonitis after trachelorrhaphy, the condition is due to one of two causes: failure to recognize pre-existing inflammatory disease of the Fallopian tubes, or septic infection introduced at the time of operation. The first, I think, is the usual cause. Very recently one of my medical friends lost a patient a few days after the operation of trachelorrhaphy from peritonitis caused by rupture of a tubal abscess which he had not recognized. Tubal disease is too often overlooked in these cases. I have often operated for pyosalpinx upon women who had but a short time before been subjected to the operation of trachelorrhaphy. During the past month I have removed the Fallopian tubes for pyosalpinx and for hydrosalpinx in women who had had the cervix uteri repaired during the previous year. It is not sufficient warrant for the operation of trachelorrhaphy merely to introduce a finger in the vagina and to recognize a laceration of the cervix, or to introduce a speculum and to see the gaping os. Such superficial examination may cause fatal results. A most careful bimanual examination is necessary to determine the condition of the tubes and ovaries, and this examination should always be made as a final precaution, when the woman is under ether, immediately before proceeding to the operation of trachelorrhaphy.

Another important fact to remember is that when a woman has a

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lacerated cervix there usually co-exist other lesions, repair of which is also necessary before perfect health can be restored. Failure to recognize these other conditions results in disappointment to physician and patient. Trachelorrhaphy alone will not cure the woman if she suffer also with endometritis, retrodisplacement, and loss of muscular support to the pelvic floor. Curetting of the uterus is usually a valuable addition to the operation of trachelorrhaphy, and perineorrhaphy is in most cases also necessary.

You are, of course, familiar with the operation of trachelorrhaphy, for repair of laceration of the cervix uteri, which was invented by Emmet. But there are several very important points essential to the success of this operation which are very often neglected. Chief of these is the previous preparation of the cervix. Women are often sent to the University Hospital suffering with old laceration of the cervix uteri, with the request from the physician that they be operated upon immediately. The cervix is hypertrophied and congested; often full of Nabothian cysts, hard, sclerotic, presenting a catarrhal patch or erosion, perhaps the size of a silver dollar, surrounding the cervical canal. Such a cervix is in no condition for operation. Most women with old lacerations of the cervix uteri require a certain amount of local treatment before the operation can be successfully performed. Such treatment may require ten days or a month.

It consists in the free puncture every five days of the whole cervix to evacuate the cysts and to relieve the congestion. The thorough application of Churchill's tincture of iodine to the whole vaginal vault and the cervix and exposed canal. The use of the glycerin tampon to relieve congestion and frequent hot-water douches. The change which takes place in the cervix uteri and in the feelings of the woman after from one to four weeks of this treatment is wonderful. The hypertrophied cervix diminishes in size. The cysts disappear, inflammatory tissue is absorbed, the cervix is softened, and the area of erosion shrinks until it occupies only the true cervical canal. With the improvement in the local condition, the woman's suffering diminishes. The backache, sideache, and leucorrhea improve; and I have sometimes found that women, after such local treatment, refuse operation, because they feel perfectly well without it. Operation is, of course, however, necessary, for the old condition will return as soon as the local treatment is stopped. Such local treatment not only makes the operation more certain of curing the woman, but it renders the operation very much easier of performance. There is less bleeding; the tissues are less friable; excision is easier, and the sutures can be passed more easily and with more precision.

If, after a few weeks of rest and such local treatment, there is not

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a decided improvement in the condition of the cervix, then I think it very doubtful whether the woman will be cured by the operation of trachelorrhaphy.

In some cases of long standing the secondary changes in the cervix become permanent in character. The cystic degeneration becomes too widespread, the inflammatory induration too well established to yield to any treatment; and then amputation of the cervix becomes necessary. Therefore, in extreme cases, the preparatory treatment to which I have alluded is of advantage in enabling us to determine the best method of operation to pursue. If the condition of the cervix improves, the woman can be cured by trachelorrhaphy; if it does not improve, we shall be obliged to resort to amputation. It should not be forgotten that the mere closure of a tear of the cervix, even though union may be perfect, does not always cure the woman. It will not cure her if the cystic degeneration and the sclerotic condition persist. I have recently amputated the cervix for these conditions in three women in whom bilateral laceration had been closed, well and successfully so far as the mere surgical result was concerned; and yet the sclerotic and cystic condition persisted and the woman continued to suffer with all the symptoms presented before the trachelorrhaphy.

In regard to the details of the operation of trachelorrhaphy I will allude only to one mistake which is very often made and the occurrence of which destroys any benefit that might be derived from the operation. This concerns the method of introducing the sutures. In a case of bilateral laceration after the tissue upon each side of the lips of the cervix and in the angle of laceration has been excised, we have upon each lip two raw surfaces between which lies the strip of mucous membrane which is to line the new cervical canal. A mistake which is often made consists in introducing the needle so that it emerges upon the raw surface, and when this occurs the suture does not include in its embrace the whole of the denuded area, and after union has taken place we have produced the condition which has been described as incomplete laceration of the cervix,—a cervix closed to all external appearances but having a canal, perhaps three or four times as broad as normal, bounded on each side by but little more thickness of tissue than the mucous membrane of the vaginal aspect. The result is persistence of the subinvolution and a cervical catarrh which will yield to no treatment except another operation. I have several times this winter operated upon the cervix which had been closed in this way. It has been necessary to treat it as a primary case of incomplete laceration, to split up the line of union, to excise the tissue again, and to introduce the sutures in the proper way, so that they enter upon the vaginal aspect of the cervix, pass around the whole of the denuded area, and emerge

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in the edge of the mucous membrane which has been left for the cervical canal.

Before concluding this paper, I wish to speak of a condition which is of great interest from a pathological point of view and which might be of considerable medico-legal importance. This is a condition of congenital lateral split of the cervix uteri. The appearance was described by Fischel in 1880, and in his paper he gives a photographic illustration of the cervix of a new-born infant presenting this condition. He says, "I am now able to show a photographic representation of the cervix of a new-born infant which presents an inferior degree of this condition. The separation of the lips does not extend all the way to the vaginal junction, but concerns only the lower two-fifths of the lateral corners, nevertheless, the two lips deprived of their commissures gape open, the crest of one being nine millimetres from that of the other, exposing the cervical surface of both lips for a distance of five to six millimetres." "This case shows that a peripheral notching of the cervix is not always a sign of a previous labor, but may represent a condition of the cervix in pregnant women whom we were forced to consider primiparæ not only through their own statements, but also from the condition of the external genitalia." "This case is of great medico-legal importance, in that the proof of a former labor can no longer be claimed for such a condition of the cervix."

I have recently seen two women in whom I have found a condition which I think must be due to a congenital splitting of the cervix. One was a married woman, about 30 years of age, who had never conceived. In her there was a state of things resembling perfectly a bad bilateral tear of the cervix with marked eversion of the lips, and the two lips of the split cervix could be brought together so that the appearance of a normal cervix was produced.

The other was a respectable girl of 16 years. There was an unusually perfect hymen, with an orifice barely large enough to admit the little finger. The hymen was so delicate that it was lacerated by the gentle traction of a very small Sims speculum. The cervix uteri was split on the left side, and, though there was no eversion, the os was surrounded by a catarrhal patch. The appearance was identical with that very often seen in women who have a slight cervical tear after a miscarriage or labor. The girl had never been treated for any uterine disease, and the condition was discovered accidentally during an endoscopic examination of the bladder.

Finally, gentlemen, permit me to call your attention to the importance of diagnosticating as early as possible between a bad laceration of the cervix uteri with erosion and beginning cancer of the cervix. Cancer of the cervix in practically all cases occurs in an old laceration.

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All statistics show this. Cancer of the cervix is a disease of child-bearing women. One series of statistics shows that the average number of children per woman with cancer of the cervix is five,—an unusually large average productivity. For this reason I think that all, except the slightest lacerations of the cervix uteri, should be closed ; so that when the woman reaches the menopause, the age of the greatest liability to cancer, the cervix uteri may not present a spot of least vital resistance favorable for the development of this disease. But this is prophylactic medicine. Contrasted with these cases are those in which cancer has already begun in an old laceration. The cases on the border-line between chronic, deep-seated, non-malignant disease of the cervix the result of laceration, and the earliest stages of malignant disease. It is of the greatest importance that we recognize these cases early. I cannot over-rate the importance of this early diagnosis. Upon it depends the life of the woman. I think that it is no exaggeration to say that if the disease is recognized early hysterectomy promises cure in the majority of cases. While, if the diagnosis is delayed for a few months, the case becomes hopeless with our present surgical methods.

If the physician has even the slightest suspicion of malignant disease in a case of laceration of the cervix uteri, he is criminal if he idly waits developments. There are two methods by which the early diagnosis may be made. If with local treatment, as puncture, tincture of iodine, glycerin, and douches, the condition improves and the suspicious appearance disappears, the disease is not beginning cancer. Or we have even a quicker test by microscopic examination of a portion of excised tissue. The suspected tissue should be hooked up with a tenaculum and a wedge-shaped piece cut out with curved scissors. This is practically painless and can be done without ether.

I have on several occasions during the past winter diagnosticated in this way cancer in the very earliest stages. In one case the attending physician told me that the condition of the cervix had not improved under preparatory local treatment conscientiously carried out for four weeks. To digital examination and unassisted visual examination there was no indication of malignant disease. It looked like an ordinary bilateral laceration with erosion. I excised a small portion and the microscope showed malignant disease.

I have ventured to dwell upon this point in speaking of laceration of the cervix because most women with cancer of the cervix die of the disease, and their horrible deaths could be avoided by early diagnosis.

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CEPHALIC TETANUS.

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CEPHALIC TETANUS; GENERAL TETANUS ASSOCIATED WITH HEMIFACIAL PARALYSIS; RECOVERY.[1]

By De Forest Willard, M.D.,

Surgeon to the Presbyterian Hospital.

ASSISTED BY

James I. Johnston, M.D.,

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The coexistence of unilateral facial paralysis with tetanus is a sufficiently peculiar combination to warrant the classification of the cases presenting these two prominent symptoms into a distinctive class, to which has been applied the title of cephalic tetanus, or head tetanus, Kopftetanus, tetanus hydrophobicus, etc. The latter term was employed by Rose from the fact that the spasm of the muscles of deglutition often occasioned such dysphagia as to resemble hydrophobia; but its use is misleading. In the majority of the cases of recovery the spasm did not extend beyond the muscles of the jaw and pharynx; but in the case about to be reported the disease became general, and all the muscles of the body were involved, thus making a case of general tetanus.

The rarity of cephalic tetanus is illustrated by the fact that this patient is the only reported living case in America, while but two other American cases have been placed upon record, that of Phelps,[2] which died on the sixteenth day, and Hunt's case,[3] which died on the sixth day.

In the variety known as cephalic, the tetanus is produced by injury affecting one of the cranial nerves, and is accompanied by hemifacial paralysis. The history of the majority of cases of head tetanus is that of slow onset, and, as in ordinary tetanus, the severity of the disease is determined by the rapidity of onset and of development, the acute cases being speedily fatal, while the chronic ones frequently recover.

History.—Joseph T., 12 years of age, was admitted to the hospital wards November 23, 1894, with the following history: Ten days before admission, while at play, he was struck by a small, dirty stick taken from the ground. A slight wound was inflicted near the inner canthus of the right eye, just breaking the skin. The wound was dressed in the receiving ward of the hospital, and the patient referred to the surgical dispensary, where two or three days later the wound was again

[1] Read before the College of Physicians of Philadelphia, March 6, 1895.
[2] Transactions New York Academy of Medicine, November 12, 1888.
[3] Transactions College of Physicians, Philadelphia, 1862, 466.

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dressed and found in good condition. The patient did not return again for about a week, when it was noticed that he had a peculiar spastic gait, and that he also had paralysis of the facial nerve on the right side, with trismus. While in the dispensary he had a slight attack of spasm of the muscles of the jaw and neck. He stated that he first began to walk unsteadily about three days before, and found he could not whistle nor open his jaw.

The symptoms probably commenced about one week after the receipt of the injury. The child was taken into the hospital ward at once, on probably the fourth or fifth day of the disease.

On admission, the patient was suffering from peripheral paralysis of the facial nerve on the right side, which was the seat of injury. He had a peculiar jerking gait, and suffered from stiffness of the muscles of the legs, abdomen, back, and neck, with marked trismus. The paralysis involved the fibres supplying the frontal and orbicular muscles, as well as those of the cheek. The risus sardonicus was naturally present only on the unaffected side.

From the history the patient had had no spasm before that seen in the dispensary. Near the inner canthus of the right eye was a red, edematous area, the seat of the wound, now healed. There were no signs of suppuration of the wound, rendering it impossible to obtain material for making cultures. He complained of no pain in the wound or elsewhere. The pupils were normal and reacted readily both to light and distance, while the right eye could not be closed and was the seat of conjunctivitis. Trismus was by this time so marked that the patient could open his mouth only about one-fourth the normal amount, and with difficulty could protrude his tongue, which was coated and at the edges bore evidences of having been bitten. The muscles about the neck were prominent and rigid, especially the posterior group. The chest was well formed, and the head and lungs were normal. The abdominal muscles and those of the back were hard and prominent; otherwise the abdomen was negative on examination. The scrotum and testicles were normal, the prepuce was adherent, but was easily pushed back, and considerable smegma was removed. The temperature was normal and his general condition was good.

The first night in the hospital the patient slept well, but the following night he was quite restless and cried out several times in his sleep. Three days after admission, the eighth of the disease, the trismus was much more marked, the muscles of the neck and back were stiffer, and a tendency to opisthotonos was first noticed. He then for the first time complained of continuous pain in the back and legs, and he was quite rigid all over except his arms, which could be readily used, although his grip was weak and his thumbs presented a tendency

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to be drawn into the palms of the hands. He resisted the most vigorous efforts to flex the legs on the thighs, but could slowly flex them voluntarily when told to do so. The right leg was the more rigid.

On searching for the cause of the facial paralysis, an indistinct history of a "running ear" on the right side was obtained, and a careful examination was made by Dr. C. A. Burnett, aurist. The tympanic membrane was found to be normal, as well as the meatus and the auditory canal, and there were no evidences of mastoid disease. On this date the patient bit his tongue twice, but was seen in no marked spasm.

The day following the boy was etherized and the cicatrix loosened by a tenotome, as the scar could not be excised without causing subsequent contraction of the lower lid and eversion. The opisthotonos and trismus increased, and only liquids through a tube could be taken. During deglutition slight spasms of the muscles of the pharynx occurred (hydrophobicus). Pain was complained of principally in the right heel and calf of leg. When the patient was turned on his side, the arching of the back and legs and the retraction of the head were greatly marked and accompanied with flushing of the face.

On November 29, the twelfth day of the disease, the temperature was 101.4° F., pulse 98, and respiration 20. This was the highest temperature during the course of the disease. By December 1 some improvement of the lad's condition was noticed. He slept better, pulse and temperature were normal, he could swallow much better, and the trismus was not so great. At this time he could flex his leg on the thigh (the right one), but not the left. The right side was the side of the injury. The opisthotonos remained about the same, as far as the head, neck, and body were concerned, but he still complained of pain in the back and legs. There were still occasional spasms of pharyngeal muscles, accompanied by flushing of the face during deglutition, and the patient bit his tongue once or twice.

On December 5 (nineteenth day) the trismus and opisthotonos again increased, pains in the right leg and heel were more marked, and the temperature rose to 99.8° F., pulse 100, but weaker, and respiration 24. The entire body was now so rigid that when rolled upon his side the position of the limbs presented precisely that of a frozen cadaver. The feet were extended in a straight line with the legs, and none of the joints of the lower extremities could be flexed except by full force of a man's strength. The bowels were constipated, requiring enemata.

On being visited on the morning of this date he was found by the resident uncovered and with the bedclothes in disorder and soiled by feces and urine, possibly the result of an opisthotonos spasm, although heretofore no general convulsion had been seen. The next day he

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complained of pains in the head and back, was quite rigid, and had an involuntary discharge of urine. During the night previous he had bitten his tongue and cried out with pain in his right leg, which was relieved by rubbing. He then improved, and by December 11 his condition was the best since admission to the hospital. There was no change in the facial paralysis. At this time a careful examination of his eye-ground was made by Dr. George Strawbridge, and the following report made: "There is anemia of both optic nerves, especially the left. There is no choked disk and no signs of tortuosity of the veins. Both show physiological excavations." Otherwise the eye-fields were normal, and there was no evidence of intracranial pressure.

An examination of the ears was again made at this time, and the tympanic membrane was found to be normal on both sides, and no pus was found in the external auditory canal. The handles of the mallei were plainly seen. The patient now was on the highway to recovery.

On December 14 (twenty-eighth day), while the paralysis of the face was still complete, reactions to the different electric currents were tested by Dr. James Hendrie Lloyd, as follows: "To faradism on the right side the response is free to a moderate current, perhaps slightly less than on the left. To galvanism the response is free to a medium current (eight cells). Because of the excitation of the patient reactions of the different poles were not taken." Dr. Lloyd kindly saw the case daily, and made many helpful suggestions.

On the following day the patient attempted to get out of bed in the absence of the nurse, and, falling to the floor, received a wound of considerable size on the scalp, which required suturing. For two nights before the accident he had been very noisy, rebellious, and evidently delirious. At one time he was so boisterous that morphia hypodermically was given, and for some time afterwards he was quite stupid, although only a small dose had been employed. For a short time after the accident the patient was much more rigid, but this soon passed away.

On December 19, about one month after admission to the hospital, he was bright, quiet, and rational. There was but slight rigidity, while he could move all his limbs readily and open his mouth easily. He expressed himself as being very hungry,—for a month he could take nothing but fluid food, and would have nothing but milk. At this time he still occasionally voided urine involuntarily. For the next ten days he improved very slowly and was very irritable, seeming much better in the evening than in the morning hours. He was now moved back into the general ward from which he had been isolated. His facial paralysis, which had begun to improve a few days before, was now rapidly disappearing, and there were scarcely any signs of

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trismus, but there was still some hardness of the muscles of the back and abdomen. His pain had almost disappeared, and by January 7, 1895 (fifty-two days), the patient was up out of bed. On January 9 he was able to walk alone, but with a halting, spastic gait. The facial paralysis had now almost disappeared, and both eyes could be readily closed. His gait improved slowly, and at the present time the boy is perfectly well.

Remarks.—The features worthy of note in the above case seem to be, first, that the patient suffered evidently from general traumatic tetanus of a chronic nature, and recovered after an illness of about two months; secondly, there was associated with it a unilateral facial paralysis, which disappeared with recovery from the tetanus; third, the wound was an insignificant one, but involved the filaments of a cranial nerve; fourth, throughout the course of the disease the patient was not at any time in a markedly asthenic condition nor threatened with asphyxia; fifth, there was a decided improvement of the symptoms for a week after the subcutaneous section of the nerves in the injured area; sixth, the infecting bacillus probably came from the earth and reached the system through the markedly susceptible infection-atrium of the eyelid. The stick may have been soiled by manure also, which is a favorite soil for the growth of the bacillus.

Hulke[1] reports a case of tetanus with facial paralysis occurring in a man, 27 years of age, in which there was both a wound of the finger and of the nose. He had a right-sided facial paralysis with initiative symptoms of trismus. The patient died about two weeks after the receipt of the wound, of asphyxia, due to spasm of the muscles of respiration. There was here complete absence of tetanic spasms of the trunk and limbs, they being of a clonic character.

Nankivell[2] also reports a case of acute traumatic tetanus complicated with facial paralysis, which proved fatal four days after trismus first appeared, and ten days after a slight attack of facial erysipelas from a wound on the bridge of the nose. In this case, also, the paralysis was on the side of the face. There was no opisthotonos, but the patient had several general spasms, and died of asphyxia caused by spasm of the muscles of respiration. The man had attended the out-patient department for his erysipelas, and the day he paid his last visit and was discharged cured being cold and wet, Nankivell offers for an explanation for the facial paralysis the probability of his catching cold and suffering from an inflammation in the aqueductus fallopii, and thus producing the palsy.

[1] London Lancet, July 12, 1882.
[2] London Lancet, July 14, 1883.

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Huntingdon[1] also reports a case of tetanus with double facial paralysis which recovered. In this case a lad of 14 years fell and received a small wound on the forehead. Trismus appeared in ten days, and six days later the jaws were firmly locked and there was complete paralysis of both sides of the face. This patient also suffered from frequent cramps in the legs and abdomen, while the arms were but slightly involved. One week after the paralysis became complete it began to subside on the left side, and in another week the right side began to improve. He was discharged in six weeks almost well, and when seen six months later was in perfect health. In this case dysphagia was the prominent symptom.

As will be noted, in none of these cases was there marked opisthotonos; they all suffered from dangerous symptoms of asphyxia, while the present case had very marked opisthotonos, but practically had no embarrassment of respiration, suffering only from pharyngeal spasm occasionally during deglutition.

Gowers, writing of cephalic tetanus (Kopftetanus), called also hydrophobicus by Rose, says that it results from wounds of the head, chiefly of the fifth nerve. Its chief peculiarity is that the initial trismus is associated with paralysis of the face on the same side of the injury. He also states that all parts of the facial nerve are involved, but the cause is not known, as no degeneration of the nerve has been found; hence it has been supposed to be of a reflex character.

Cultures were not made in the present case, as the wound was healed at the time of admission to the hospital. Later, and in the absence of pus, it was deemed unwise to open the wound or to attempt any inoculation experiments on the white mouse, as the bacilli are but infrequently found in the blood.

Examination of the urine on two occasions gave negative results.

The treatment pursued in the case was as follows:

The patient was put to bed in a darkened and isolated room, which was kept at a temperature of about 72° F., and guarded from draughts of air, from noises, and from disturbance. The diet throughout consisted almost entirely of milk, the patient preferring this to other forms of liquid food, and never tiring of it. As there was a marked tendency to constipation, the bowels were kept open by calomel with an occasional enema or brisk saline. The surgical treatment consisted of subcutaneous section of the nerve filaments leading to the cicatrix with a narrow tenotome, which procedure was followed for several days by a subsidence of the symptoms. The medical treatment consisted of the administration of bromides, chloral, and opium, increased from small doses (he was 12 years of age) until he took each twenty-four hours

[1] London Lancet, September 17, 1892.

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seventy-five grains of bromide, thirty grains of chloral, and thirty-six drops of tincture opium deodorata. These doses were maintained steadily for four or five weeks. He was never narcotized, and during the day slept but little. On December 15, when he became so noisy and unmanageable, he was given one-eighth of a grain of morphia hypodermically, which was the only hypodermic given. At no time were we called upon to give an anesthetic for convulsions. When he began to convalesce and was on a fuller diet milk-punches containing two drachms of whiskey were given three times a day.

On February 15 the patient was discharged from the wards cured. All signs of facial paralysis were absent and the boy was the picture of health. During the early part of attack an attempt to procure and use the antitoxin for tetanus, as recommended by Tizzoni and Cattani,[1] was made, which proved futile, as none could be obtained. This was unfortunate for the antitetanin, but possibly not for the boy, as he is now entirely recovered, and the plan of treatment by antitoxins is still in its experimental stage. When dealing with a poison of such intense virulence, however, as that of tetanus any and all means of cure should be employed. At the time I was deeply disappointed at the failure to secure the antitoxin, but the favorable result under the plan of treatment adopted is most satisfactory.

Klemm,[2] as well as Brunner, believes that the injury need not be limited to the distribution of the facial nerves, but that the paralysis, which is toxic, may be due to injury of any of the cranial nerves. Klemm very properly draws a distinction between the cases where the spasm remains limited to the muscles affected by the initial symptoms, as in true cephalic tetanus and in those (as in the case under consideration) where the spasm becomes general and in whom the conditions practically become those of ordinary tetanus. It is advisable to distinguish such cases from those not associated with paralysis. It is quite possible that all cases of tetanus commence with these local spasms in the region of the injury; but the local condition, being in the hand or foot, is unobserved, especially in acute cases where more prominent symptoms speedily develop. The facial region being so abundantly supplied with nerve filaments is probably more susceptible to irritation of the tetanus bacillus and is a most favorable infection-atrium. The facial muscle-mechanism is also exceedingly delicate. The presence of this bacillus in the earth must be limited, as a very large proportion of injuries become soiled with earth.

The poison of tetanus has two modes of action; *first*, peripheral,

[1] Medical Press and Circular, London, 1894, LVIII, 153; also Berliner klinische Wochenschrift, 1893, Vol. XXX, pp. 1185, 1215, 1245, 1265; 1894, Vol. XXX, pp. 64, 772.

[2] Berliner klinische Wochenschrift, 1893. p. 63.

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by direct alteration of the peripheral nerves; *second*, by reaching the central nervous system through the circulation.

It is difficult to decide why the symptoms in grave cases remain distinctly local. But the slow onset would indicate that an inherent germicidal action was at work destroying the invading bacilli in some instances; while in other cases this phagocytosis is overpowered by the virulence of the poison, and the toxin is admitted to the general system.

Billroth[1] states that the character of the symptoms points evidently to a local contagion.

Not every case of injury of the cranial nerves, even when followed by tetanus, is accompanied with facial paralysis. In a case seen some years ago in consultation with Dr. J. A. Ogden, the wound was in the forehead and had nearly healed when symptoms of tetanus developed, but there was no paralysis. I promptly excised the scar, but the patient died in two days. Dr. Ogden, in a recent letter to me, reports two cured cases of tetanus, but in neither case was there associated paralysis.

Merlich[2] gives a most valuable paper on this subject, and a large number of references to the literature. These, with the references found in the *Index Catalogue* and the *Index Medicus*, show that much valuable work has been done upon this subject. Merlich also gives several excellent microscopical drawings of the appearances found in the motor region of the trigeminus.

Taf (XIII, 1, 2, 3) demonstrates the degeneration and vacuolation incident to this condition. He also agrees that this variety of Hopftetanus may follow an injury to any of the cranial nerves, but is more frequently found after injury to the orbicular and nasal regions.

The influence of the tetanus bacillus in the production of this condition seems thoroughly demonstrated, thanks to the work of Nicolaier, in 1884, the first one to show the causative action of the soil in the production of this disease. His experiments, followed by those of Rosenbach, and especially those by Kitasato,[3] who isolated the pin-shaped bacillus and obtained pure cultures, are most valuable. Guinea-pigs and white mice are the animals especially susceptible to this poison. The pinhead and drumstick appearance of the short rod is evidently due to sporulation at the end or ends. The bacillus is markedly anaërobic.

A number of alkaloids, tetanin, tetanotoxin, muriate of spasmo-

[1] Lehrbuch der allgemeine Chirurgie, S. 507.

[2] Archiv. Psychiat., 1892, XXIII, p. 672.

[3] Deutsche medicinische Wochenschrift, 1889, XV, No. 31, p. 635; also Zeitschrift für Hygiene, 1890, Bd. VII.

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toxin have already been separated, and it is probable that in time the product of the bacillus will be employed for the cure of this disease, as is indicated in the present use of the various antitoxins. The use of tetanus antitoxin has been chiefly advanced by Tizzoni and Cattani.[1]

Brunner,[2] by a series of experiments, determined that injections of cultures of the tetanus bacillus into animals, or of the cultures free from the bacilli, will produce tetanus, the spasm starting after a few hours in the muscles in the region injected. If the injection is made in one side of the face,—*e.g.*, the left, this is first involved, then the right side of the face, then the left forelimb, then the right, and then the rest of the body.

Post-mortem examinations of the animals revealed no characteristic microscopic changes in the nervous system or any of the tissues. He gives a number of excellent illustrations of the effects on rabbits and guinea-pigs.

Injections of a considerable amount of the poison in the face often determine a paralysis of the muscles in the immediate region; injection into the blood-current or peritoneal cavity produces general tetanic manifestations, not preceded by local spasm. The bodily temperature of the injected animal sank steadily. Attempts to obtain from the tetanus poison separate alkaloids, as tetanin, tetanotoxin, spasmotoxin, as causes of the different manifestations, were not successful. The symptom-complex is produced by the undivided filtrate of cultures.

The tetanus poison circulates in the blood of animals suffering with tetanus; it is also found in the urine and saliva.

Injections of the poison into a motor sensory nerve—*e.g.*, sciatic—produce the same effect as a subcutaneous injection, first local, then general spasm. Injection under the dura mater produces, first cephalic, later general tetanus.

The tetanus poison cannot cause muscular spasm by direct action, but must act through the nervous system; and if a motor nerve to a region is cut, injections of the toxin in this region cannot produce spasm. The centres in the medulla, pons, or cord must also be intact for the production of spasm, but the higher centres are not essential. The poison does not act reflexly, but by a direct action on the central motor apparatus, probably reaching this along the nerve-trunks rather than by the blood or lymph-channels. It can ascend the motor as well as the sensory tract.

The cause of facial paralysis has given rise to much discussion.

[1] Medical Press and Circular, London, 1894, Vol. LVIII, p. 155. Berliner klinische Wochenschrift, 1893, Vol. XXX, pp. 1185, 1215, 1245, 1265; 1894, Vol. XXX, pp. 64, 72.

[2] Exper. u. klin. Studies ufer de Kopftet.; Beitrag für klinische Chirurgie, Bd. LX, pp. 83 and 269; Berliner klinische Wochenschrift, 1891, Vol. XXVIII, p. 881; Deutsche Zeitschrift für Chirurgie, Bd. XXX, S. 574.

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In my own case a most careful investigation was made to exclude the possibility of its being merely a coincidence due to independent causes, and the absence of middle-ear disease, intracranial growths, brain abscess, etc., were thoroughly demonstrated.

In the present stage of our bacterial knowledge it seems much more rational to refer it to a direct toxic effect of the poison acting upon the filaments of the seventh and fifth nerves rather than to a "cold, rheumatism, etc."

I have succeeded, with the kind assistance of Dr. Alfred Hand, Jr., in collecting 75 cases of cephalic tetanus; 57 males and 13 females are noted. In 45 acute cases (counting those acute ones in which the symptoms have developed within the first week), 39 died and only 4 recovered; a mortality of 90 per cent. Of 32 chronic cases (where the symptoms arose after the first week), 8 died and 24 recovered; a mortality of 25 per cent.

Gowers states that all cases over 25 years of age died; but my table shows that of acute cases (one week) there were 2 recoveries in 32 cases in persons over that age, and 13 recoveries in 15 persons who were classed as of the chronic variety. Under 25 years, in 12 acute cases there were 2 recoveries, and in 16 chronic cases, 13 recoveries.

In the 75 collected cases when the spasm extended to the muscles of the jaw, throat, and neck they have been denominated "local;" while if opisthotonos and spasm of limb muscles occurred they were denominated as "general." There were 29 cases of the former condition and 46 of the latter. Of the "local" cases, 14 recovered and 15 died; while of the "general," 14 recovered and 32 died.

In this form of tetanus, as well as in general tetanus, the actual mortality is far higher than statistics will indicate, as in my personal experience I have certainly seen twenty deaths from tetanus to one of recovery, and yet none of the twenty fatal cases are on record.

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No.	Reporter.	Reference.	Sex.	Age.	Acute or Chronic.	Local or General.	Result.
1	In Richter's Chir. Bibliothek, 1791.	Cited by Brunner, Beitr. f. klin. Chir., 1892–93.	M.	10	Acute.	General.	Recovery.
2	Hurst.	Trans. Phila. Coll. Phys., 1892, III, 465.	M.	16	Acute.	General.	Death.
3	Larrey.	Cited by Rose.	M.	30	Acute.	General.	Death.
4	Zuicke.	Charité Ann., IX, p. 366.	F.	39	Chronic.	Local.	Recovery.
5	Jacksch.	Wien. med. Presse, 1888, No. 18.	F.	38	Chronic.	Local.	Death.
6	Duplay, cited by Séreins.	De la contracture réflexa d' origine traumatique, Thèse, Paris, 1880, No. 435.	M.	19	Chronic.	Local.	Recovery.
7	Nicolaysen, cited by Séreins.	De la contracture réflexa d' origine traumatique. Thèse, Paris, 1880, No. 435.	M.	23	Chronic.	Local.	Recovery.
8	Terelon and Schwarz.	Revue de Chirurgie, 1888, No. 1.	M.	16	Acute.	Local.	Death.
9	Travers, cited by Pflüger.	Die sensorieschen Functioners des Ruckenmarke, p. 81.	M.	11	Chronic.	General.	Recovery.
10	Larrey.	Memoires de Chir. melit., III, p. 307; also Pflüger, loc. cit. p. 82.	M.	. .	Chronic.	General.	Death.
11	Crossonard.	Étude à l'Appre de l'Origine infect. du tetanos, Thèse, Paris, 1887.	F.	33	Acute.	Local.	Recovery.
12	Dumshard.	Cited by Séreins, loc. cit.	M.	55	Chronic.	Local.	Recovery.
13	Kirchhoff.	Berl. klin. Wochen., 1879, No. 25.	F.	52	Acute.	General.	Death.
14	Pollock.	Cited by Rose.	M.	33	Chronic.	. . . . .	Death.
15	Rockliffe.	Brit. Med. Journ., 1890, No. 1591, p. 86.	M.	7	Chronic.	General.	Recovery.
16	Middledorpf.	Bresl. ärztl. Zeitschr., 1883, p. 8.	M.	9	Chronic.	General.	Recovery.
17	Gütterback.	Arch. f. klin. Chirurg., B. 30, p. 836.	M.	21	Chronic.	General.	Death.
18	Von Wahl.	St. Petersburg med. Wochen., 1882, No. 39.	M.	41	Acute.	Local.	Death.
19	Klemm.	Deutsche Zeitsch. f. Chir., 1889, XXIX, 3, p. 168.	F.	40	Chronic.	Local.	Recovery.
20	Hadlick.	Berl. klin. Wochen, 1885, XXII, p. 266.	M.	2⅓	Chronic.	General.	Recovery.
21	Rose.	Ibid., p. 86.	M.	28	Acute.	General.	Death.
22	Rose.	Ibid., p. 88.	M.	. .	Acute.	General.	Recovery.
23	Kirchner.	Aerztl. Bericht. Preuss Feldlazarth, etc., Erlangen, 1872.	. .	. .	Acute.	General.	Death.
24	. . . . .	St. Bartholomew's Hosp. Rep., 1874, Appendix, p. 40.	. .	. .	Acute.	Local.	Death.
25	Von Langenbeck.	Berl. klin. Wochen, 1869, No. 35.	M.	7	Acute.	General.	
26	Lehrubecher.	Bar. ärztl. Intelligenzblatt, 1882, No. 46.	M.	49	Acute.	General.	Death.
27	Mayer.	Prag. med. Wochen, 1883, No. 34.	M.	18	Chronic.	General.	Recovery.
28	Bond.	Brit. Med. Journ., November 10, 1883, p. 918.	M.	23	Chronic.	General.	Recovery.
29	Bernhardt.	Zeitschr. f. klin. Med. 1884, p. 410.	M.	32	Acute.	General.	Death.
30	Maissurianz.	St. Petersburg med. Wochen, 1887.	M.	35	Chronic.	Local.	Recovery.
31	Triglis.	Gironale di Neuropatologia, 1884, I, p. 80.	M.	50	Chronic.	Local.	Recovery.
32	Genffré.	Lo Sperimentale, 1887, p. 380.	M.	51	Chronic.	. . . . .	Recovery.
33	Lannois.	Rev. de Méd., 1890, II, p. 168; also Lyon Médicale, 1889, LXII, p. 380.	M.	69	Acute.	Local.	Death.
34	Charcot.	Soc. de Chir., October 10, 1888.	M.	. .	Acute.	General.	Death.
35	Perret.	Cited by Albert, Étude sur tetanos cephalique, p. 26.	M.	59	Acute.	General.	Death.
36	Phelps.	New York Acad. of Med., November 12, 1888.	M.	. .	Acute.	General.	Death.
37	Remy and Villar.	Gaz. des Hôp., 1888, No. 142.	M.	36	Acute.	General.	Death.
38	Brennecke.	Inaug. Dissert., Göttingen, 1890.	M.	12¼	Chronic.	General.	Death.
39	Widenmann.	Würt med. Correspondenzblatt, 1889, No. 8.	M.	8	Acute.	General.	Death.
40	Roberts.	Lancet, July 11, 1891.	M.	64	Acute.	General.	Death.
41	Brunner.	Berl. klin. Wochen., 1886, No. 7.	M.	27	Acute.	Local.	Death.

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No.	Reporter.	Reference.	Sex.	Age.	Acute or Chronic.	Local or General.	Result.
42	Brunner.	Berl. klin. Wochen., 1886, No. 7.	M.	38	Acute.	General.	Death.
43	Brunner.	Beitr. f. klin. Chir., 1892, p. 291.	M.	19	Chronic.	General.	Death.
44	Van Spanje.	Weekbl. v. nederl. Tijdsch voor Geneestr., 1891, II, No. 10.	M.	60	Acute.	General.	Death.
45	Billroth.	Chirurg. klin. Wien, 1868, No. 77.	M.	37	Acute.	General.	Death.
46	Nankivell.	Lancet, July 14, 1883.	M.	33	Acute.	General.	Death.
47	Oliva.	Gazette de Chir., 1886.	M.	52	. . . . .	Local.	Death.
48	Wagner.	Schmidt's Jahrbuch, 1884, p. 139.	M.	42	Acute.	Local.	Death.
49	Nerlich.	Inaug. Dissert., Halle, 1892.	F.	46	Acute.	General.	Death.
50	Thenée.	Berl. klin. Wochen, 1880, p. 531.	F.	55	Acute.	General.	Death.
51	Terrier.	Cited by Sériens, loc. cit., p. 31.	M.	49	Chronic.	Local.	Recovery.
52	Gosselin.	Cited by Terilon and Schwarz, loc. cit.	M.	. .	Acute.	General.	Death.
53	. . . . .	St. Thomas's Hosp. Rep., x, p. 461.	. .	. .	Chronic.	General.	
54	Sériens.	L'Union Méd., December, 1886.	M.	59	Acute.	Local.	Recovery.
55	Buss.	Centralbl. f. Chir., 1890, p. 831.	. .	. .	Acute.	General.	Death.
56	Guastalla.	Cited by Rose, p. 89.	F.	40	. . . . .	General.	Recovery.
57	Pflüger, loc. cit.	Cited from Med.-Chir. Trans., Vol. IV, p. 25.	F.	50	. . . . .	General.	Recovery.
58	Zsigmondy.	Aerztl. Bericht. v. allg. Krankenhaus, Wien, 1879, p. 76.	F.	41	. . . . .	Local.	Death.
59	Buisson.	Gazette hebdom., 1888, No. 3.	M.	60	Chronic.	General.	Recovery.
60	Wartmann.	Cited by Brunner, loc. cit., p. 310.	M.	11	Acute.	General.	Recovery.
61	Behr.	Inaug. Dissert., Tübingen, 1891.	M.	25	Acute.	General.	Death.
62	Brunner.	Loc. cit., p. 314.	M.	. .	Acute.	Local.	Death.
63	Brunner.	Loc. cit., p. 314.	M.	13	Chronic.	General.	Recovery.
64	Poisson and Rappin.	Gaz. Med. de Nantes, 1893–94, XII, p. 93.	F.	30	. . . . .	Local.	Recovery.
65	Caird.	Edinburgh Hosp. Rep., 1893, I, p. 491.	M.	12	Acute.	General.	Death.
66	Navarre.	Lyons Médicale, 1894, LXXV, p. 152.	F.	56	. . . . .	Local.	Death.
67	Reclus.	Cliniques Chirurg., Paris, 1894, 8vo., p. 150.	F.	56	. . . . .	Local.	Recovery.
68	Reclus.	Loc. cit.	M.	43	. . . . .	Local.	Death.
69	Reclus.	Loc. cit.	M.	19	. . . . .	Local.	Recovery.
70	Reclus and Chaput.	Loc. cit.	. .	. .	. . . . .	. . . . .	
71	Caird.	Loc. cit.	M.	26	Acute.	General.	Death.
72	Caird.	Loc. cit.	M.	57	Acute.	Local.	Death.
73	Campos.	Cronicl. med.-quir. de Hebaus, 1890, XVI, p. 255.	M.	39	Acute.	Local.	Death.
74	Hulke.	Med. Press and Circ., London, 1882, XXIV, p. 25.	M.	27	Acute.	General.	Death.
75	Willard.	Trans. Coll. Phys. Phila., 1895; also UNIV. MED. MAG., 1895.	M.	12	Chronic.	General.	Recovery.

EXTIRPATION OF THE LARYNX FOR MALIGNANT DISEASE.

AT a recent meeting of the Académie de Médecine of Paris, Prof. Péan presented a man from whom had been removed two years previously the entire larynx, the superior portion of the esophagus, and the anterior portion of the pharynx for carcinoma of the larynx. Breathing, eating, and drinking were made possible with the aid of a suitable prothetic apparatus. The patient could, besides, make articulate sounds, so that speech could be understood.

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ON DIGITAL EXAMINATION AND TREATMENT OF CERTAIN MORBID CONDITIONS OF THE NASAL CHAMBER.

By Harrison Allen, M.D.

[CONCLUDED FROM PAGE 578.]

III.—The Form which is Dependent upon Sclerosis (with or without Atrophy or Necrosis) of the Anterior End of the Middle Turbinal.

Case IX.—G. E. S., a medical student in Philadelphia, aged 23 years, reported September, 1879, having suffered for ten years from an atrophic catarrh; both chambers were involved. The right inferior turbinated bone was atrophied. The discharge was fetid and very abundant; large greenish casts of portions of the chambers, semitubular in form and over an inch in length, were occasionally expelled. An older sister and one brother have at some time suffered from chronic nasal catarrh, two other members of a family of ten have slightly impaired hearing. All the cases in the family dated distinctly from attacks of scarlet fever with severe catarrhal symptoms. The family history was unexceptionable in preceding generations. The patient was anemic from close application to study. These conditions culminated five years later, and before the close of treatment in an attack which threatened pulmonary phthisis, one slight hemorrhage was reported. The patient was advised by eminent authority to locate in Colorado.

The most careful treatment in this case was made by the ordinary methods of treating chronic nasal disease for an extended period with little permanent benefit. As a result of a prolonged cautery treatment, a diminution in the amount and character of the discharge was acknowledged.

In April, 1886, the patient, while still greatly improved, complained of attacks of complete nasal obstruction brought on by exposure. After each attack the discharge became abundant and purulent. At this stage I obtained consent to make a digital examination under ether, when I removed a large quantity of fungoid membrane from the anterior portion of the left middle turbinated bone. The patient did well after the operation, except for an attack of epistaxis on April 20, which compelled the plugging of the chamber in front before the bleeding could be checked. Since this time no treatment has been necessary. The discharge gradually disappeared and the patient became practically

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well. His weight and general health improved as a result, and he considered his present practically normal condition due in large degree to the result of this treatment. The patient did not go to Colorado, but is in prosperous practice in Philadelphia.

Remarks.—Of the varied treatment in this case, that which was apparently productive of the greatest results was the removal under ether of diseased structures. The general bearings of the nasal symptoms upon the subject of pulmonary phthisis is of great interest.

CASE X.—Dr. F. R., aged 34 years, reported November 4, 1887. There is a history of tuberculosis in the family on both sides. His mother died of Bright's disease and one brother has ozena. The patient has suffered from a chronic catarrh since his sixth year and from atrophic rhinitis since his tenth year. The condition last named abruptly developed and is associated with pyorrhea alveolaris. At the date of reporting, the odor from the nostril was insufferable and threatened to entirely break up his professional and social relations. The patient was gradually getting nervous, and had fits of weeping without apparent cause, and suffered from great depression of spirits, not only on account of the destruction of his prospects, but as a result of the impairment of his health and of imperfect sleep. The membranes were everywhere moist and covered with a thick layer of albumen-like material which was excessively fetid. When this material was carefully removed by a weak solution of carbolic acid thrown into the nasal passage, it was observed that the turbinals were in an atrophic state. The anterior ends of both middle turbinated bones were slightly enlarged.

The nasal chambers were symmetrical, no point of pressure or abnormal positions of the parts were anywhere seen. They were free from crusts.

I immediately proposed that the patient be etherized. I found the parts yielding readily under the pressure of the finger, and the anterior part of the middle turbinals on both sides were removed without difficulty. The patient was confined to his room for a week. He has since remained entirely relieved of the offensive odor. The improvement in his general health is striking. The patient recovered from the direct and indirect results of the fetid catarrh and from the depression arising from the fetor of the nasal chambers.

At this date, October 30, 1890, there is a moderately free discharge of muco-pus posteriorly. The general health is good. The dyspepsia and nervousness improved. The weight is increased and the mind disposed to study.

Remarks.—This case was a typical form of advanced atrophic rhinitis in a subject having a tubercular history. The most satisfactory results followed the digital exploration.

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CASE XI.—E. B. A., aged 58 years, reported September 8, 1885. He has had from early youth a copious discharge from the nasal chambers which was worse on the right than on the left side. It was a remarkable circumstance that through this long period until a year ago the discharge was always mucoid, and within the year preceding that of report only did it become muco-purulent. The material escaped both through the nostril and backward into the throat.

There appeared to be no throat lesion. The tonsils were normal and the roof and sides of the pharynx yielded nothing worthy of note. The anterior ends of both middle turbinated bones were occupied by a moderate amount of thickened and chronically inflamed tissue. The septum was inclined towards the left side throughout, the right chamber being therefore the larger.

The membrane over the anterior ends of the turbinals were removed with the snare on September 24. The parts having entirely healed from the operation it had been found that the amount of discharge was scarcely at all diminished, and I proposed that the patient be etherized and the parts subjected to a careful examination with the finger. A very grave condition was detected on the right side. The membrane was soft and pultaceous over the middle turbinated bone and was removed without effort. The finger, when carried into the middle meatus, came in contact with a roughened resisting surface which gave the impression of sclerosed bone covered with thickened membrane. I removed with a coarse drill all the roughened projecting portions, but owing to their extreme hardness failed to make much impression on the bones themselves. The left side was found to be in a normal condition.

The patient did well after the operation until the second day, when he complained of a pain over the right side of the frontal sinus. The integument soon became red and tender to pressure. A diagnosis of inflammation of the frontal sinus was made. The parts were leeched (two drachms of blood being drawn) and hot fomentations applied to the skin on the brow. The symptoms subsided in a few days and the patient made a satisfactory recovery.

The condition of the parts within a week after the operation was very satisfactory, much more so than I had anticipated: the discharge diminished; the degree of comfort increased. A feeling of congestion about the head had persisted for so many years that he had accepted it as a condition scarcely worth mentioning, but now the relief was gladly acknowledged. In a very short time after the operation the patient returned to his home in Minneapolis and was not seen until April 9, 1885, when he returned for a second treatment. He complained now only of a discharge which passed into his throat. This, while moderate in quantity, was muco-purulent.

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Since the date of the treatment in September, I had concluded that some forms of catarrh are due to the pressure of the middle turbinated bone against the septum, and I suggested that he be etherized, and this probability made the subject of special inquiry. On April 12 I etherized the patient, and passing the fifth finger in the right nasal chamber determined that the middle turbinated bone was, indeed, not only resting against the septum, but was in union therewith. Owing to the extreme hardness of the parts no attempt was made to separate them. In other respects the condition of the parts in the nose was much improved from the time of operation.

Even after this manipulation which I had concluded led to no practical conclusion, the amount of discharge diminished, a fact which might be explained by the moderate amount of depletion of the blood-vessels of the mucous membrane. The patient soon afterwards returned to his home. I have since heard from him on several occasions. The discharge is almost entirely cured and the general health greatly improved.

Remarks.—This case illustrates the amount of relief which may be secured under conditions somewhat unfavorable. The age of the patient, the chronic character of the disease, the inability to reach all the affected structures, lead me to give a guarded opinion of the results of treatment. Nevertheless the amount of good accomplished was decided. The attack of acute inflammation of the frontal sinus was the only one of the kind which I have seen. It proved to be of short duration and did not interfere with prompt recovery.

CASE XII.—M. H. C., aged 10 years, reported July 17, 1887. As a sequel of pneumonia at the eighth year a chronic catarrh was established. The fetor was extreme, and the discharge was of a crust-like character. The nasal chamber would become filled with this material and at irregular intervals be forcibly dislodged with pain and bleeding. The general condition of the child was excellent. The father was a physician of prominence in a neighboring city, and had exhausted all the usual means resorted to for the relief of nasal catarrh before reporting. I immediately proposed that the child be examined under ether. This was done July 19. I found the anterior portion of the left middle turbinated enormously enlarged, feeling to the sense of touch as though fully one-half inch wide. The bone was exceedingly hard and covered with a number of horn-like spicules. With the aid of a chisel I removed the spicules and attempted to make some impression on the hardened lamina of the bone itself, but in this not much progress was made and I finally desisted.

The condition of the child was greatly improved after the operation. No crusts were seen on the left side, but they continued to form on the

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right as before. The naso-pharynx was examined with ease, showing that the irritability was excited for the most part by causes within the nasal chamber. On January 7, 1888, ether was administered a second time, and an operation similar to that performed on the left was essayed on the right side. The patient a few days after the operation passed from observation and was not seen until June 3, 1888. At this date the following note was made: The patient is greatly improved. It is true that crusts still form in both chambers, but only at the rate of about one a week and are easily removed without distress. There is no odor whatever anywhere about the person of the child. The membrane covering the middle turbinated bone is slightly thickened and vascular.

I recommended that the saturated solution of nitrate of silver be applied to the anterior end of the middle turbinals once a week. I saw the child at these intervals until the beginning of January, when she appeared to be in every respect well. I have no knowledge of this case since January 19, 1889.

Remarks.—This is a typical case of localized disease in the nose, acting as an exciting cause to disease in a child whose general health is good. The cure is effected by essaying the removal of the diseased tissue by surgical means. In children, at least, some of the eburnated tissue may be untouched and yet relief will be acknowledged.

CASE XIII.—Mrs. C. S. J., aged 40 years, reported March 25, 1887. The patient is a highly cultivated woman of the intellectual type. She had suffered for many years from distressing mental impressions. These impressions were of a varied character and were included within loss of memory, vertigo, dulness of mental impression, and confusion of ideas. Her attention had never been directed to their possible nasal origin, though they had existed for many years with a chronic nasal catarrh of a mild type. She also complained of anosmia, which was absolute for nearly all odors except those of a disgusting character. In addition, a morbid sensation was noted which was vaguely described as a "suffocating feeling." For the last five years she has been a confirmed mouth-breather, and for more than six months has suffered from headaches, which were probably excited by loss of sleep incurred while nursing a sick child. The catarrh was of a mild grade. The nostrils were constantly excoriated with a thin discharge. There was a disposition to a hacking cough. The patient would never have come under treatment had it not been that one of her children had been treated by myself for an adenoid growth in the pharynx, and the striking change in the child after the operation had invited attention to her own condition.

On examination, the pharynx was found to be so irritable and the

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velum so persistently elevated that no view of the naso-pharynx was practicable. The roof of the hard palate was not elevated and the rugæ were symmetrical and well defined. Seen from in front the septum was markedly deviated to the left causing the right chamber to be the larger. The triangular cartilage was very thin but not perforated. The right middle turbinated bone directly back of the thin compressed border abruptly widened and lay against the septum on the inner side, and extended well out towards the lateral wall of the chamber on the other. Impressed with the unusual size of the right middle turbinated bone, I instituted a series of treatments with the saturated solution of nitrate of silver and the galvano-cautery. These treatments were continued twice a week for a period of two months with the most gratifying results. The suffocating feeling and the headaches entirely disappeared, but the other symptoms remained unchanged. I then suggested examining the parts under ether, believing that some unknown factor existed, the nature of which the sense of touch alone could determine. On May 19, while the patient was under the influence of ether, I passed my finger into the right nasal chamber, and found the anterior end of the right middle turbinated bone to be sclerosed and the membranes infiltrated. I was unable to make any impression on the bone after the general manipulation already described; but the thorn-like projections were removed with a coarse saw and the parts permitted to bleed freely. No attempt was made to change the position of the septum, but the finger was passed within the left side and the anterior end of the turbinated bone was found to be laminar and exhibited no diseased action. The choanæ on both sides were smaller than usual, and on the right side the disposition existed for the mucous membrane covering the inferior turbinals to press against each other and against the septum. The inference was drawn that prior to the operation this tendency to occlusion had been marked and had probably been the cause of the mouth-breathing. No treatment had been directed to this portion of the nasal passage, and yet the habit of mouth-breathing had been in time corrected, which I attributed to the reduction of the vascular turgescence in the nasal chamber. It is interesting to note that as the result of this little operation, mouth-breathing was gradually corrected, and by March 17, 1888, about two months after the operation, she breathed in a normal manner through the nose. There was also a gradual improvement in the vertigo and the intellectual faculties. The patient was last seen May 6, 1888, with the following report: The headaches and suffocating feeling had gone; mouth-breathing was permanently corrected; the disposition to vertigo very much diminished, although the anosmia remained unchanged. The memory was improved and confusion of ideas had disappeared.

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Remarks.—First. The most striking comment that can be made upon this case is the existence of disease of the anterior end of one of the middle turbinated bones as an exciting cause to the establishment of mouth-breathing in the adult by exciting swelling of the membrane of the choanæ.

Second. The co-existence for many years of abnormal mental impressions associated with vertigo. These were not of a character which interfered with the highest use of the mental powers.

Third. That it is not always necessary to remove all the diseased tissues within the nasal chamber in order to relieve some of the complex symptoms arising from their presence.

CASE XIV.—Miss L. O. D., aged 23 years, a teacher of elocution, reported July 6, 1884. She complained of dropping from the upper to the lower part of the throat, which interfered with her professional work. It not only caused unseemly interruption in her declamation, but prolonged efforts at phonation were followed by fatigue and huskiness. There was a constant dull ache at the sides of the larynx and a sense of fulness which did not appear to be hysterical. These symptoms had continued for four years. They were gradually becoming worse, and had now threatened her professional prospects. The family history was unfavorable. Her father and two paternal uncles had died of phthisis. One sister at the age of eighteen months had died of some acute affection of the brain.

Examination of the naso-pharynx showed the left choana to be slightly smaller than the right, and a very small and inconspicuous adenoid growth at the vault, which appeared to be no more than was normally present in every young adult. No discharge was seen clinging to the vault of the chamber in any direction. The tonsils were small, retracted, and nodular. The infratonsils were more conspicuous than usual, as was also the case with the basi-lingual glands. The nasal chamber, as seen from in front, showed the left side to be slightly the smaller, but not to a greater degree than is generally found to be consistent with health. The anterior ends of the middle turbinated bones, although examined with great care, did not appear to be the seat of diseased action.

The prognosis was guarded. No salient points for local treatment in the nasal passage or naso-pharynx were detected. Cod-liver oil was administered, and, since the hope was entertained that the tonsils and allied glands were the seat of irritation, a treatment was at first directed to them; but this treatment was not followed by the benefit anticipated. The treatment was interrupted by an attack of otitis media of the left side, which did not, however, appear to be catarrhal in nature, and was certainly not caused by the treatment. The patient returned to her

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home in northern New Jersey, and was not heard from until June 1, 1887. She had now given up her profession, the dropping being worse than before, and she was suffering from headaches, which were accompanied with marked depression of spirits.

I now instituted a series of treatments to the vault of the pharynx and to the anterior ends of the middle turbinated bones. The adenoid growth was removed by the Farnham forceps, and the vault in addition scraped by the finger introduced through the pharynx, while applications of the saturated solution of nitrate of silver were made to the middle turbinated bone from in front. The treatment was followed by some benefit, the patient returning home after an absence of two months.

On January 2, 1888, the patient returned for the third time. The dropping still continued. I resolved to explore the nasal chamber from in front while the patient was under ether. On January 4 I examined the right nasal passage and found the mucous membrane covering the anterior ends of the middle turbinated bone infiltrated and softened. This was removed with the finger. A few days after the operation the sense of dropping was materially improved. Encouraged by this, the patient anxiously besought me to perform the operation on the other side. But this was deemed imprudent, and the procedure was not undertaken until March 1, 1889. The relief from the second ablation was not so marked as that from the first, but gradually the improvement was acknowledged, and by June 6, 1889, the dropping had entirely ceased.

Remarks.—Thus after long and tedious treatments, which would have been impossible had not the distress of the patient led her to persist in efforts to seek relief, complete cure was accomplished. The dropping ceased, and the laryngeal fatigue and huskiness of voice disappeared therewith. The following points can be made on this interesting case:

First. That a marked disposition to tuberculosis does not of necessity interfere with surgical treatment of chronic catarrh of the nasal passages.

Second. A case which was at first sight an undesirable one for operations was in the end alone relieved by surgical means.

Third. That a posterior discharge, while commonly associated with fibroid change in the tonsils, infratonsils, and the adenoid mass at the vault, may persist after these causes of excitement have been removed.

Fourth. That the disease of the anterior ends of the middle turbinated bone may defeat all efforts to relieve catarrh until these are removed.

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Fifth. That ablation may be the only way of accomplishing this result.

CASE XV.—S. E., aged 17 years, reported March 17, 1887. She had been suffering from catarrh of four years' duration. There was impairment of hearing of the right ear. She suffered constantly from headaches, which became worse when she entered a boarding-school in Philadelphia.

Examination showed a small but rather pendent adenoid growth at the vault of the pharynx. The anterior ends of both inferior turbinals were particularly swollen. After a month's treatment, the progress not being satisfactory, on April 24, 1887, I operated under ether, rasping away the adenoid growth with the finger and exploring each nasal passage from in front, but nothing was found to remove. The bones everywhere were exceptionally robust. There was no disposition for the membrane of the anterior end of the middle turbinated bone to yield. There was no pressure of any of the parts against each other. The patient made a satisfactory recovery, her improvement being announced from the date of operation.

Remarks.—I have in this case an admirable example of the fact that an adenoid growth, although too small to obstruct nasal respiration, may impair the hearing, excite nasal catarrh, no lesion of any kind existing within the nasal passage. The patient had had no headaches since the date of operation.

CASE XVI.—Miss N. L. P., aged 35 years, a kid-glove-maker, reported January 11, 1883. From her eighth year (at which time she suffered from traumatic inflammation of the nose following a fall) she had complained of collections of tenacious mucus in the pharynx and the occasional presence in the nasal chamber of thin crusts. The nostrils were habitually tender and excoriated. It was not until three years ago that the breath was in any way offensive. The patient complained of a constant slight dropping from the nose into the throat, with occasional teasing and distressing sensations. She described this distress as "difficulty in clearing the head." There was a slight deafness in the left ear,—the degree not measured. The patient was subject to attacks of "cold in the head," during which time all her symptoms were exacerbated.

Examination of the naso-pharynx showed a high angle at the vault with a mass of grayish mucus adherent to the posterior side of the angle near the vault. The axoid tubercle was prominent. The choanæ were asymmetrical, the left being much the smaller, and the middle turbinal vertically disposed. When seen from in front, the anterior portion of each middle turbinated bone was infiltrated, of a dark-red color, and marked by bright reflections of light. The septum

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was bent (not acutely flexed) to the left. The uncinate process of the right side was placed transversely. No crusts were visible.

The general nutrition of the patient was not good. She was of spare habit, suffered from cold hands and feet, and had a muddy complexion. Suspecting a constitutional impress, I examined carefully for a history of syphilis; but besides a sharply-colored patch on the groin and a small bran-like spot on the left forearm, detected nothing.

The treatment consisted of applications of saturated solutions of the nitrate of silver to the anterior ends of the turbinated bones twice a week. The muco-pus was removed from the vault of the pharynx at each visit with the forceps. Three drops of Donovan's solution were ordered to be taken three times daily. A slight degree of improvement had gradually been obtained in June, 1883, when the patient ceased reporting.

After a long interval she reported for a second treatment, January 14, 1889. She described her distress as still existing. She had continued the Donovan solution on alternate months, as I had directed, in all this long interval. She acknowledged an improvement, but declared that she was not well. A re-examination of the parts enabled me to locate a spot of vascular turgescence on the septum just in front of the middle turbinated bone, as well as at a point opposite to this bone. I then instituted a series of local depletions, twice weekly. I also examined the parts under ether, and with the aid of a chisel rasped and cut away the anterior border of the inferior portion of the middle turbinal. These treatments were continued, while applications of the saturated solutions of the nitrate of silver were also kept up until April of the same year. She acknowledged most satisfactory improvement. The discharge of the naso-pharynx practically ceased. On September 5, 1889, she again reported to express her satisfaction of the treatment in the early part of the year. A slight disposition for the dropping of mucus into the pharynx persisted, but it no longer formed masses. Her general health had improved and her complexion was clearer.

Case XVII.—Miss J. C., aged 18 years, reported June 3, 1889. She complained for six years of a sense of stoppage in the right nostril and a discharge both front and back. This varied in character. At times it was mucoid, at others inspissated, and at others again crust-like. A high grade of headache was present. On examination of the naso-pharynx I detected a small nodule in the pharyngeal vault, which was probably not a cause of the catarrhal state. As seen from in front the nasal chambers were normal. The septum was not deviated. The right middle turbinated bone was laminar in form, and was the seat of an extensive, chronically-inflamed swelling. Inferring that the mass was degenerated and would not yield readily to local treat-

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ment, I suggested etherization, the object in view being to remove a portion of the bone. This was accordingly done on June 7. The bone was found softened, and the anterior portion was easily broken down by the finger and removed with forceps.

On June 12 the patient again reported, when I snared a second portion. I saw her at intervals of a week apart. The remains of the swelling were removed with the snare, the patient after each manipulation making a satisfactory report. By July 8 the patient was dismissed cured.

She reported again September 19, 1889. The parts were firmly healed, and all catarrhal symptoms had disappeared.

CASE XVIII.—Miss E. U., aged 21 years, reported March 3, 1887. She had complained for ten years of a collection of inspissated mucus in the vault of the naso-pharynx, which was partially dislodged each morning with difficulty and distress. In addition to the above symptoms, accumulation of crusts occurred in each nasal passage. Marked fetor was present. Three years ago the sense of smell gradually became affected, and in the last two years has entirely disappeared. The sense of taste was normal. Upon the slightest application being made to the middle turbinated bone there followed a reflex laryngeal cough. The patient declared that she was always worse during the "hay-fever" season, a period which appeared to answer to the late summer and the early fall.

No examination of the naso-pharynx was practicable owing to the excessive irritability of the throat. The axis-tubercle was unusually large, and the basi-cranial angle was exceptionally acute. Seen from in front, the nasal passages, after being cleansed of their inspissated secretions, showed the middle turbinated bone on each side to be placed high up and back, and the inferior turbinated bone to be raised far above the inferior meatus. Both middle turbinals were of a dark purple color and exceedingly vascular. The septum was not deflected. An abrupt convex swelling was detected on the floor of the inferior meatus, about half-way between the nostrils and the choanæ. The incisive pad was of a deep purple color, especially along its sides. The base of the tongue was occupied by an enormously enlarged group of basi-lingual glands. These bodies here and there yielded filiform epithelial proliferations. The epiglottis was compressed and possessed a thick anterior border. The patient was anemic, of a sallow complexion. For a height of five feet four inches the weight was but 106 pounds. She was compelled to use twelve handkerchiefs a day.

The evidences of disease were so conspicuous, the degree of chronic infiltration of the middle turbinated bones so marked, that I immediately proposed that the patient be etherized and a thorough

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exploration of the parts be made. On March 16, the patient being under ether, the little finger was inserted in the left nasal chamber and was easily carried to the outer wall of the chamber, but adherent by membranous synechial bands to the septum. The membrane from the anterior portion of the bone was exceedingly thick and soft, and was easily peeled off from the underlying structures. The bone itself was spiculated, roughened, and eburnated. Dark venous blood flowed profusely from the parts. The condition being unusual, I declined even examining the nasal chamber of the opposite side.

The patient reported in my office April 4, acknowledging considerable relief. The middle turbinated bone of the left side was covered with a number of round grape-like granulations, which were vascular but not painful, and did not excite cough when they were touched. They were destroyed by the galvano-cautery. On June 10 the patient volunteered a statement that the sense of smell had returned. The first circumstance which led her to acknowledge this was the odor of flowers and of fresh-mown hay. The patient was now so far improved that she but used six handkerchiefs a week.

On November 14 (the patient being without treatment during two months of summer) I began a reduction of the diseased membrane on the right side. Inferring that hypertrophied and softened tissues with bony eburnation existed (as I had demonstrated them to exist on the right side), and being desirous to avoid a second operation under ether, I began incising small portions of the mass of the anterior part of the bone at each sitting, using the Farnham forceps for the purpose. But the progress was slow, and I proposed reluctantly that operation under ether be performed a second time. On March 10 the patient accordingly was etherized, the object in view being to reduce the swelling over the right middle turbinated bone. The manipulation in all respects was similar to that of the left side, and need not be described. The patient did admirably after the operation, and was measurably improved.

By March 30, 1889, the complexion was clear, and the discharge was so far decreased as to be scarcely a source of annoyance to the patient, who chiefly reported for a complaint of fetor.

I now began a series of local depletions. The septum just in advance of the middle turbinated bone in each nasal chamber was found to be turgescent, the slightest prick of the part with the point of the knife being followed by free oozing of blood. So great was the temporary improvement which followed the bleedings that a period of three weeks would elapse before a repetition was suggested. They were always most efficient directly after a menstrual period.

The patient reported October 25, 1889, after an absence of three months. The patient is entirely well, save a disposition to a slight

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tenacious mucoid pharyngeal discharge. This is the result of the accumulation of the mucus which collects in the naso-pharynx during the night. There are no nasal symptoms save at the menstrual period (when a moderate amount of mucoid secretion is thrown off) and at the hay-fever period, as above defined.

Inspection shows the naso-pharynx and the nose to be free from retentions of secretion. The middle turbinated bones are narrow and laminated as they would naturally appear after the removal of the anterior inflated portion. The membrane covering them is firm, gum-like, there being no appearance of scar-tissue. The anosmia remains unchanged.

IV.—Chronic Hyperplasia of the Anterior End of the Middle Turbinal.

Case XIX.—Mrs. L. B., aged 24 years, reported January 29, 1887. She had suffered for three years with an excessive muco-purulent discharge from the nose into the pharynx. The attack began with what she termed an "ulcerated sore throat." By the time this attack had subsided, an intense acute coryza was announced, which gradually passed into the chronic state of catarrh already mentioned. A short time after this, asthmatic attacks were developed. These assumed the forms of seizure of true asthma at the times of inception of fresh cold, which was more frequent when the patient was living in the country than when in the city, although there appeared to be no estival paroxysms. The discharge appeared to be always worse in the morning, and after the nocturnal collection had been removed the patient was fairly comfortable for the remainder of the day. There was slight dysphagia. She complained of a sense of weariness which was referred to the side of the throat. A moderate use of the voice and particularly reading aloud intensified this sensation.

Both middle turbinals were in a state of hyperplasia anteriorly. The septum was straight between the inferior turbinals, but was markedly deflected to the right between the middle turbinals. The patient remained under systematic care for three months without apparent amelioration. At the end of this time she consented to be etherized and have the parts carefully examined. The left nasal chamber was found to be very narrow in front. The left middle turbinal was inflated and pressed outward. On the right side a greater degree of involvement of the middle turbinated was detected. The spicules indicating hyperostosis of the bone were unusually conspicuous. Everything in the way of manipulation was accomplished with ease. On the evening of the operation a slight epistaxis occurred, followed by headache and earache, and subsequently by prostration,

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which lasted for three days. I did not see the patient during this period, but the facts were reported to me May 10, nearly three weeks after the operation. The patient was entirely cured. She has had no attack of asthma since the etherization, and the muco-purulent discharge of the pharynx has entirely ceased.

Remarks.—This case presents the novel feature of a patient having no care during the period immediately following a digital examination, so that the sequelæ of slight bleeding, earache, and headache may be included among the dangers of neglect during an after-treatment. Nevertheless the result was most gratifying.

CASE XX.—Miss F. C., aged 19 years, reported November 20, 1884. She had always been a sufferer from nasal catarrh, the symptoms of which became worse a few years before the date at which she reported. The discharge was muco-purulent.

I saw this patient at regular intervals of a week to a fortnight for three years. She derived temporary benefit from treatment, which lasted for a month at a time, but on the slightest accession of a fresh cold the distressing symptoms would return.

On April 15, 1887, I obtained her consent to make a digital examination of the nasal chamber. I found the right middle turbinated bone to be of enormous size, appearing to fill up the entire nasal chamber. The nostril and vestibule were exceedingly small and narrow, and at first it seemed impossible to force the little finger through. The middle turbinated bone was thick along its entire border, and broke down to a moderate extent only on its median surface. The bone was also bound in a moderate degree to the outer wall. The left nostril was examined, but it was allowed to remain intact. Excellent results were secured by this manipulation.

The patient removed to a distant point, and was not seen a month after the operation. Favorable reports have been received from her by letter.

CASE XXI.—Miss G. R., aged 26 years, reported on April 4, 1887. She had been epileptic from childhood. The seizures had often been numerous, severe, and for a long time she had been the subject of headache and chronic nasal catarrh. The discharge was chiefly from in front and copious. A distressing morning cough was reported. The case was referred to me by Dr. S. Weir Mitchell, the object being to determine to what degree the condition of the nose influenced the nervous state.

Upon examination, the chambers were found to be intensely injected. The left middle turbinated bone was of great size. The septum was sinuate, being deflected to the left inferiorly and to the right superiorly. After keeping the patient under observation for two

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weeks I determined to etherize her and make a digital examination. This was done on April 9, 1887, with the most careful deliberation, for I had never before attempted the operation upon an epileptic subject. I found the anterior end of the left middle turbinated bone covered with a thick, soft, vascular membrane. This being removed, venous blood of an exceptionally dark color flowed freely from the nostril. No attempt was made to examine the right side. The improvement in the condition of the patient subsequent to this examination was remarkable. For four months after the examination the epileptiform attacks entirely ceased. At this period she had one severe attack followed by a long period of immunity, and though it was not anticipated that the effect of the operation would have any effect upon the attacks, these have never been so numerous nor so severe since the date of the manipulation. The headache has entirely disappeared, and the symptoms of the catarrhal disposition greatly ameliorated.

I have since operated on this patient at intervals of six months to a year, always at the request of the attending physician, Dr. Clayton, who informed me that after each manipulation, either from the effect of local depletion or from other local cause, the patient's condition is greatly improved.

CASE XXII.—Mrs. D. P., aged 39 years, reported October 30, 1888, complaining of the symptoms of chronic nasal catarrh. A disposition existed to frequent attacks of coryza. Dropping of mucus into the pharynx had been noticed for a period of eight years. The patient stated that one year before date of reporting the discharge from the throat became muco-purulent. About the time of this change she became subject to violent attacks of neuralgia in and over the right eye and in the temple of the corresponding side. These attacks occurred as often as once a week, and, at the date of reporting, were increasing in severity. Occasionally they were accompanied with nausea. There was a disposition to lachrymation on the right side, although no obstruction of the lachrymal duct could be demonstrated. The right nasal chamber was the larger of the two. As seen from in front, the septum inclined in all its parts towards the left, so that it was with great difficulty that a view was obtained of the interior of the left side of the nose. It was not until January 3, 1889, after eight visits had been made, that I succeeded in seeing the middle turbinated bone in a degree sufficient for me to form a correct idea of its condition. I ascertained its form to be inflated anteriorly, notwithstanding the narrowed shape of the vestibule at the plane of the ascending process of the maxilla. The chamber was sufficiently dilated directly back of the process to receive the greatly-widened and chronically-inflamed bone.

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I attempted to reduce the mass by application of the galvanic cautery, and on February 13, 1889, instituted a series of local depletions on this part and on the septum opposite to it. Progress, however, was slow, and I concluded that the bone was sclerosed, the membrane over it degenerated, and that an operation would secure the greatest measure of relief.

This was accordingly performed April 23, 1889. I found the right middle turbinal hard and resisting and covered by an exceedingly soft, degenerated, vascular membrane. The patient was kept in her room for a week. As soon as the crusts and clots ensuing on the operation were removed she began to show marked improvement. This continued until June 19, when the patient returned to her home in a neighboring city. The headache, nausea, and dyspepsia, and also the flow of mucus into the throat had disappeared, and the patient, in all respects, reported herself as cured.

CASE XXIII.—Mrs. J. M. K., reported December 24, 1887. She had been suffering for ten years with a discharge into the naso-pharynx of a mucoid material, having a sweetish taste. Large masses would form in the naso-pharynx as often as three or four times a day, and the teasing efforts at dislodgement excite great distress. A reflex laryngeal cough was occasionally present. Slight disposition to deafness existed, especially in the right ear. Although the patient had been subject to migraine-like headaches, I did not know of their existence until I had advanced well into the study of the case, as she had long since taken it for granted that nothing could be done for the relief of this condition and had accustomed herself to reticence on the subject. The pain originally was located over the brow, but of late years had radiated thence to the vertex.

The patient laid stress upon a symptom she termed "voice failure." There was a history of aphonia, but a sensation of weakness, referred to the larynx, was announced towards the close of each day; this was always aggravated by prolonged use of the voice either in reading or in conversation. The laryngeal image was normal. There was a persistent pain over the sternum, which seemed to be disassociated with other symptoms.

The naso-pharynx was excessively irritable and permitted no examination of the vault to be made. The diameters were small, the tonsils tumid, and the uvula slightly edematous. The roof of the mouth was narrow and the arch high. A palatal hyperostosis was present. There was no history of mouth-breathing. Inspection of the nasal chamber from in front was not satisfactory. The parts were tumescent, and, notwithstanding the exercise of the greatest care and patience, scarcely any part of the middle turbinated bone was visible.

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On May 21, 1888, I detected that the floor of the nasal chamber of the left side was elevated in the centre and in contact with the inferior turbinated bone, and that the upper portion of the plane of the choana and the bone was seen to be small. On the roof of the pharynx there was an acute basi-cranial angle, but no adenoid growth co-existed.

At a later date I diagnosed by probing that the middle turbinals were globose anteriorly. The structures which were visible by inspection from in front were simply the small portions of the convex surfaces between the septum and the outer wall of the passages. I etherized the patient and demonstrated that the middle turbinated bones were enormously enlarged and covered with a thick, vascular, softened membrane which broke away with the greatest ease when in contact with the finger. On both right and left sides, after the membrane was removed, the bone itself was found to be sclerosed and a number of hard spicules to project from its surface. These were removed with great care by the drill and chisel. To my surprise, I found that the bony septum defective in the anterior portion of the region which answered to the perpendicular plate of the ethmoid bone. The mucous membrane of the two chambers apparently came in contact for a space the size of a twenty-five-cent piece. The greatest care had to be exercised during the manipulation to prevent this membrane from giving way. Fortunately no such accident occurred.

The patient remained under my care until January 2, 1888, when she returned to her home in one of the suburbs of Philadelphia. The most marked improvement followed the result of this operation. The headache ceased, and it was chiefly at this time that the headache was commented upon, not that it had not existed before and had now disappeared, but, as above mentioned, the patient had never spoken of headache in connection with the other symptoms. The deafness had also disappeared.

From the very large surface of denudation (the largest I had ever obtained at a single operation) there was occasionally for months after the operation a discharge of a chocolate-colored material, which was evidently an admixture of nasal mucus with blood. I did not see the patient again until January 16, 1889, when she reported with an ordinary catarrhal attack of light grade and of short duration. The sweetish taste of the pharyngeal collections has never returned even in times of excitement incident to attacks of coryza, etc. The laryngeal weakness had never returned, and the pain referred to the sternum had disappeared, showing that both these symptoms had been excited by the conditions in the nasal chamber.

CASE XXIV.—Miss A. S., aged 28 years, reported May 22, 1888.

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She had a severe attack of typhoid fever at the fourth year. About the seventh year an impairment of the general circulation was evinced by a disposition to cold hands and feet, and to the contraction of catarrhal affections of the nose and throat from slight causes. Severe attacks of sneezing developed about the date of reporting. These are especially severe in the morning immediately after arising.

Examination showed each middle turbinated bone with the anterior end brought well forward and apparently so placed that the anterior end was lodged between the septum and the ascending process of the maxilla. Both bones were red and swollen. Both choanæ were small, that of the left side being the smaller. The middle turbinated bones were vertically disposed. The septal swelling was markedly in advance of each middle turbinal. The posterior part of the inferior turbinal on the right side appeared to be slightly swollen, but did not project into the naso-pharynx. A small, apparently normal, adenoid growth was seen at the vault of the pharynx. The palatal arch was high with a moderately developed posterior exostosis.

Impressed with the fact of the false position of the anterior turbinals, I proposed that the patient be etherized, and that the anterior end of the right middle turbinated bone be removed. This was accordingly done. From causes entirely independent of the treatment, the case was not seen during the months of November and December. Early in January, 1889, I again gave the patient ether, using the agent to the first stage only, and inserting the finger into the left nostril, pressed the softened anterior end of the middle turbinal well off to the outer side, so that the part no longer impinged against the septum.

The patient reported December 9, 1889, with the statement that the attacks of sneezing had entirely disappeared, and the circulation was normal.

V.—The Form associated with Thin, Highly-Arched, Inferior Turbinals which Project far into the Lumen of the Nasal Chamber.

While the greatest interest in examination of the nasal passage with the finger relates to the anterior end of the middle turbinated bone, it must not be forgotten that the examination is often of use in treatment of disease of the inferior turbinated bone as well. Especially is the procedure useful in instances of malposition of the bone, for should the bone be placed too far towards the centre of the chamber, it is endowed with little or no erectile tissue, yet in which obstruction to nasal respiration is easily excited. Gentle pressure outward of the pendent portion of the bone is followed by excellent results. In like manner cases of catarrhal deafness are often benefited. Hyperplasia

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of the anterior end of the bone can be promptly overcome in the same way, but the parts here are easily studied, and their morbid states, as a rule, are readily overcome by other methods than the one here described. I outlined this group of cases in a paper contributed to the *Medical News*, February, 1885, p. 143.

Remarks.—Thus out of twenty-three cases recorded, the following were thought to be of a character which demanded digital examinations at once,—Cases III, IV, VIII, XV, and XXII.

Cases V and XXI were kept under observation, one week and fifteen days respectively, in order to become thoroughly acquainted with all the facts which were unusual in each instance. The remaining four cases, I, III, IV, and VII, had been carefully treated by all the resources known to me from periods varying from one month to three years before I acknowledged failure to give relief. I mention these facts to show that the time when manipulation should be resorted to must always be a matter for the judgment of the operator. Cases in which treatment had already been carried on by other physicians in whose treatment I had the highest confidence, I deemed it inadvisable to go over the ground which they had already covered. In other instances my willingness to exhaust the usual methods before proposing operation arose from the natural inclination to employ simple forms of treatment in preference to severe ones.

The results obtained by making digital examination of the nasal passages, naturally group themselves under two heads: those of cases which were under treatment at the time when the suggestion of the procedure occurred, and those which reported after the procedure had been established. This is an important element in the record for the reason that in all the older cases the use of the finger as an aid to diagnosis and treatment was attempted after other means had failed, while in those which came under notice after the year 1884 it was a procedure of selection,—the time of its performance being determined by the special facts in each instance. In the first group will be included Cases VI, IX, XIV, and XVI; in the second group all the remaining Cases.

I beg the reader to remember that no surgical interference with the nasal chambers should be unguardedly undertaken. I have a feeling of responsibility in recommending a procedure which beyond my own experience remains as yet untried. Yet I remain convinced that in my own hands, at least, none of the persons whose histories have been narrated could have been cured in any other way than by removal of diseased tissue under the guidance of the sense of touch.

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A PRACTICAL LOW-PRICED DEVICE TO SECURE THE TRENDELENBURG POSTURE.

By William A. Edwards, M.D.,

San Diego, California,

Fellow of the College of Physicians of Philadelphia, etc.

This table has now been in use for several months and has given entire satisfaction.

The posture has been very generally accepted by gynecologists the world over, so we will not comment on the position, but simply present the working detail of the rack.

The rack may be used on any narrow table, or on the ordinary ironing-board that is found in any house. In hospital work it rests on an oak slab which constitutes the general operating table; this slab may or may not have upright sides after the manner of Halsted's general surgical table.

The length of the table is 2 metres (78 inches); its width 50 centimetres (20 inches); and its thickness 37½ millimetres (1½ inches); it stands on "horses" which are 76 centimetres (30½ inches) in height.

The rack is 50 centimetres (20 inches) wide, 217½ centimetres (63 inches) long; it is constructed of 1¼ inch (31 millimetres) quartered oak and is covered with canvas, adjusted by eyelets in such a manner as to be easily removed for washing or sterilizing. At a space 107½ centimetres (43 inches) from the head of the rack it is separated in its continuity, and hinged in such a manner as to allow a foot- and leg-rest of 50 centimetres (20 inches) in length.

The total height from floor to surface of rack is 84 centimetres (33½ inches).

The accompanying photographs illustrate the table and the Trendelenburg rack in a very graphic manner, much more satisfactorily than by descriptive text.

The frame and its table are devoid of all embellishments or ornamentation; it is simply a low-priced, practical device that is easily constructed, easily cleaned, and whose canvas cover may be placed in a steam sterilizer when desired.

I am indebted to the mechanical skill of Mr. R. C. Vroom, of this city, for the technical knowledge requisite in its construction.

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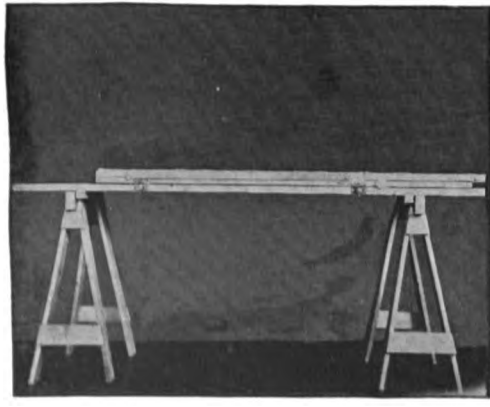

FIG. 1.—Side view, showing rack on operating table in most compact form.

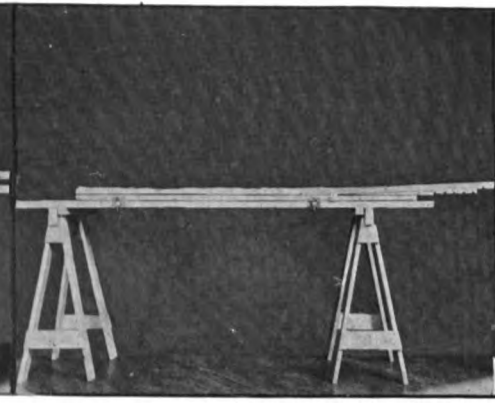

FIG. 2.—Arranged for reception of patient. Adjusting rods shown in position for elevation.

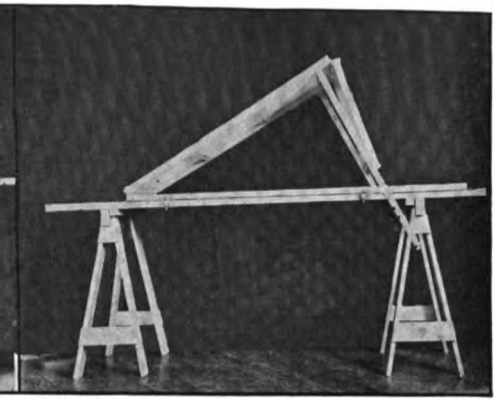

FIG. 3.—Rack in Trendelenburg position.

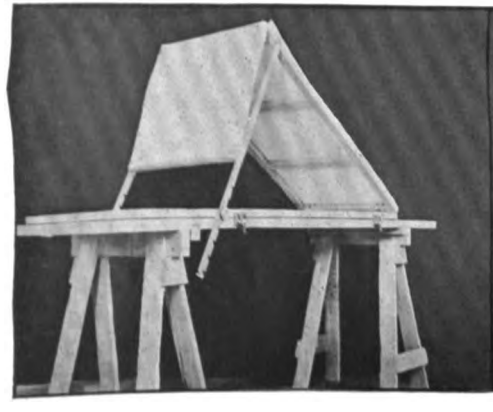

FIG. 4.—Extreme elevation.

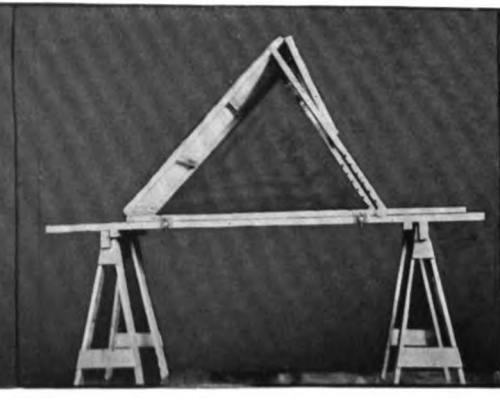

FIG. 5.—Showing leg-support and adjusting ratchet.

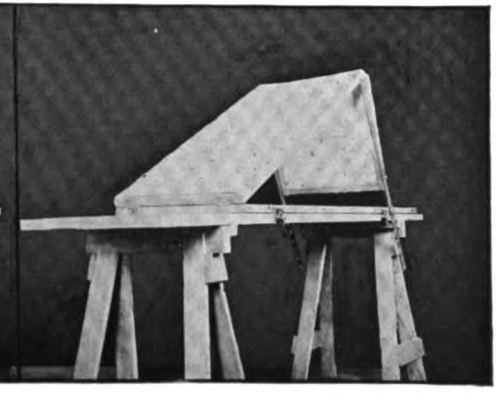

FIG. 6.—Showing body-support and adjusting ratchet, with method of supporting canvas cover for easy removal.

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THE PHYSICIAN, THE PHARMACIST, AND THE COMMON FOE.[1]

By Howard Prescott Reynolds,

Plainfield, N. J.,

Delegate of the New Jersey Pharmaceutical Association.

Four years ago, in pursuance of an invitation extended to the New Jersey Pharmaceutical Association, the speaker had the honor to stand before you as the first official representative of organized pharmacy. Then, as now, it was his agreeable duty to tender the respectful greetings of his co-workers in the art nearest of kin to your own,—the art out of which, may I say, yours grew; since, assuredly, physic *was* before physicians *were*. It should be added that the annual exchange of courtesies inaugurated by this society has been fully appreciated by the Pharmaceutical Association.

The tendency on occasions like the present to enlarge upon the relations of medicine and pharmacy is almost inevitable. But to all that has been spoken and written thereon, how is it possible, why is it desirable to add another word? Those relations differ in different localities, and change from year to year. What they *should be* is well understood; what they *are* in our day and our land is not matter for congratulation. Because of peculiar circumstances it has fallen to the speaker's lot to think and write not a little about the conditions of modern pharmacy and its relations to medicine; but to set forth even the undisputed truths as to these would be to greatly exceed the limits granted by your courtesy. With your leave, however, I will briefly ask attention to one of the tendencies of the day fraught with evil to both medicine and pharmacy. It was no novel topic which was so ably presented at your last annual meeting by Dr. Henry I. Coit, under the striking caption, "Is the philosophical practice of medicine jeopardized by the modern methods of drug-venders?" But it too seldom happens that physicians have the opportunity to learn how these methods are regarded by educated pharmacists, and how they affect the art of pharmacy. Therefore I welcome the privilege you have granted me to speak—however imperfectly—for the organized pharmacists of our State.

In the beginning I am sure that Dr. Coit will permit the reply that it is not the drug-vender's methods which can really jeopardize the practice of medicine; rather it is the unphilosophical methods of the

[1] A paper read at the annual meeting of the Medical Society of New Jersey held at Lake Hopatcong, June 26 and 27, 1894.

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physician who allows the vender to do his thinking and to supplant him in the sphere of prescribing, who accepts in place of the teachings of science and experience the interested statements of a tradesman; who takes as his guide, his *vade mecum*, the manufacturer's list rather than the United States Pharmacopeia of Dispensatory. The drug-vender's methods are of no avail in the face of a thorough acquaintance with materia medica. But now to our topic.

Within the memory of some present the relations of medicine and pharmacy have several times shifted. In the early part of the century, the country being then thinly settled, physicians habitually compounded and dispensed their own medicines, pharmacies were few and hardly existed outside the larger towns. But with the growth of population a distinction between medicine and pharmacy came about, to the gain of both. The physician was enabled to give his time wholly to the practice and study of his art, while the pharmacist was perfecting the production of the required remedies. Roughly speaking, the period in which scientific pharmacy has made its most substantial gain in America was from 1825 to 1875, a period during which our kindred arts followed each its legitimate lines of progress, and which was illuminated by the introduction of anesthetics and antiseptics, of alkaloids and fluid extracts. More recently the pendulum has taken a backward swing, not because science has paused in its mighty growth, but, on the contrary, because it has enabled enterprising men to place in the hands of physicians a line of materia medica in forms more compact, more convenient, more agreeable than those of the past. We have come to a time when a whole apothecary-shop may be carried in a satchel, when the apothecary's services are no longer indispensable to the physician. Yet, curiously enough, it has been during this last period that pharmaceutical education has made its greatest strides. Our colleges have turned out a host of bright young men, far better qualified pharmacists than their predecessors, destined, however, to disappointment, as they find little or no field for the application of their hard earned scientific acquirements in the modern retail pharmacy. For crude drugs are in small demand; chemicals, whether fine or heavy, and even fluid extracts, tinctures, and pills can be less economically produced by the dispensing than by the manufacturing pharmacist; while the latter, favored by ample capital and by modern facilities of correspondence and transportation, reaches out over the head of the apothecary to establish direct business relations with the practitioner. "Othello's occupation is gone." Little wonder that in the struggle for existence he forgets the lore of the laboratory and converts the pharmacy into a bazaar and restaurant, counting more for support upon the soda-fountain than the prescription-counter; dispensing cigars and

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confections more freely than chemicals and curatives; compelled to give more attention to cut-rate patent medicines than to pharmaceutical study. Such, indeed, is the deplorable condition of a vast majority of American druggists; and though it remains true that many of us struggle against fate, and despise ourselves for every inch we yield, yet the fact that the legitimate pharmacies of any State in the Union may be counted upon one's fingers, while scores of graduates in pharmacy issue yearly from our colleges, testify to the evil condition of our day.

Many and loud are the complaints; many and futile are the remedies proposed. In most of these things you, as physicians, are not concerned. But the speaker feels that he would be false to his opportunity if he did not, here and now, use it to utter a protest and a warning. As to the first: while the thinking men of our calling are firmly of opinion that the best results in the treatment of disease can in general be reached by the division of duties which relegates to physicans diagnosis and treatment, and to pharmacists the providing, compounding, and dispensing of medicines, these combined measures making available at once the fruit of the ages in skill, knowledge, and material; and while we know that this division of duties is compulsory under most European governments, yet we perceive that under American institutions the practice of prescription-writing cannot be required; and we clearly understand that our physicians are at liberty to adopt such methods as are most profitable and convenient to them, and most acceptable to their patients. The one restriction, however, for which we must stand, a restriction founded in justice and good sense, is that, with entire liberty to dispense medicines to his own patients, the doctor shall not keep "open shop" and practise pharmacy without qualifying therefor professionally and legally.

As to my second, a warning: Premising that as the son of a doctor, the brother of a doctor, and from youth an associate of doctors, he hopes to be pardoned for a degree of free speech,—the speaker asks serious attention to the topic so well handled a year ago by Dr. Coit, or rather to such aspects of it as occur to the conscientious and observant pharmacist; since it were obviously unbecoming for the latter to lecture medical men upon the propriety of their general methods of practice, whereas he may fairly assume to know something of drug-venders.

In Dr. Coit's paper dealers in drugs were classified, first, as professional pharmacists; second, as charlatans; third, as pseudo-scientific drug-venders. The valuable services of the first were duly acknowledged and commended; the brazen quackery of the second—the charlatans or patent-medicine projectors—was properly condemned, and

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they were contemptuously dismissed with the judgment that, by reason of their very audacity, they were precluded from constituting a hinderance to the practice of medicine. One might add that their disreputable products frequently serve to injure the health of their victims, and lead to drug habits to the extent of calling for legitimate medical service, thus in the end putting money in the doctor's purse. As to Dr. Coit's third class, it is rightly described as the greatest enemy of the profession, and in terms justified by his standing, but which the usages of courtesy forbid to the speaker, he points out that physicians not only permit themselves to be deceived, but lend themselves as tools for the deception of others; and, further, Dr. Coit shows that a reliance upon and use of ready-made pseudo-scientific combinations tends to displace a working knowledge of legitimate materia medica, to do away with the systematic observation of the effect of drugs, and thus obstruct the progress of medical art. Dr. Coit speaks plainly to his fellows, but he does not go far enough in his condemnation of his third class, probably because he does not realize—how many physicians do?—the absurdities, the audacities, of some drug-venders. To the aforesaid observant pharmacist the thought sometimes occurs, When will physicians perceive how they are imposed upon and used for imposing upon others? When will they take in hand definite measures of investigation and of self-defence? As conservators of the public health, do they not owe a further duty to the community which they have properly warned against the outright quackery of patent medicines, but which is likely to suffer from this more dangerous form of imposition? Shall the pharmacist cry aloud? Why, verily! who is *he* to question the methods of the educated physician? Moreover, it will be said that his is the voice of one crying in the wilderness because his profits are diminished or his business hurt by superior enterprise; and yet, before this audience, it is surely permissible to show some of the results of the prescribing of these pseudo-scientific compounds well known to pharmacists, unknown or unappreciated by physicians. The first and most pernicious result is a vast increase of self-medication. The more intelligent of our people are growing shy of the ordinary patent medicine (so-called); and especially is this true of the city people. But, as to the hosts of invalids and semi-invalids of the well-to-do class, they are ever on the alert for any new remedy or appliance for the healing of their pet ailments. So it proclaims itself "not a patent medicine," and has the endorsement of an "M.D.," it arouses curiosity and hope, and secures buyers. The title "D.D." may have lost drawing-power in these days of religious questioning, but "M.D." has yet a charm; and a foreign title is better than a domestic title, it seems,—that is, a French or English preparation frequently outsells the home-made

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article, its higher price being accepted as a certificate of greater value, to the discomfort of all "protection" theories. As an example of what tends to the increase of self-medication, let me remind you of a syrup of hypophosphites introduced some years since. Our own beloved Parish and Proctor had long before instructed the world in the pharmacy of hypophosphites, and their worthy successors had advanced on their teachings. But the proprietor of the preparation referred to successfully "worked" a number of physicians; his preparation—adjudged by competent critics inferior to several already in use—caught a favoring breeze of prescriptions; whiff! away it went on its beneficent errand, the "cure of consumption," and it began to be a question whether there would remain consumptives enough in another generation for the instruction of medical students! As time passed and other wonderful discoveries were announced for the cure of phthisis, physicians ceased to prescribe this hypophosphite, *but the public ceased not to buy.* In 30,000 drug-stores of America it is now a staple. In thousands of homes it is dosed for coughs and colds and "general debility." And now our friend cares not a rap for the doctors, for he has reached the people. Whether or not the people have benefited by his labors, judge ye.

With like records we might fill a day; let us write down but one more, and a brief illustration of Dr. Coit's drug-venders and their deliberate calculation upon professional influence for the introduction and sale of their products. The making of medicated tablets has come to be a business of itself. The doctor need no longer think out a prescription, here it is at hand in modification, No. 1, 2, and 3; and reference to a price-list will show how some one of these cured a case "just like" the one before us. It seems to some of us that tablet medication will outgrow itself and perish by self-abuse. But, then again, "this is a big country," and its capacities are almost illimitable. A friend of the speaker was recently questioning a great tablet-maker as to the extent and prospects of his business; said he, "After you get the doctors all stocked up, and some new thing comes to claim their attention,—then what? Why then this? after the doctors, then the people whom the doctors have taught to use tablets. We expect to sell more tablets every year to the American people than all the doctors in the world have used up to date; and the doctors may go hang!" If success be a criterion of good judgment, this man's expectation is like to be realized,—as to the sale of the tablets, not as to the fate of the doctors, let us hope.

Self-medication means harm to the health of the people and injury to the personal interests of the physician. Other injuries have been alluded to. Let us consider one point more,—viz., the opportunity for

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fraud lurking in the methods of the pseudo-scientific drug-vender. Within a few months has been launched a new and, of course, "wonderful" nutritive compound, described as "*not* a drug."

Warning and protest are submitted in the light of these illustrations. Stronger voices, abler pens than mine have already called attention to these things. I am not here to proclaim superior virtue or knowledge for pharmacists, but rather to urge that both pharmacists and physicians owe to the public, not merely the services which they are paid for; but they owe the service always due from knowledge to ignorance, from strength to weakness. Heedful of these duties, aroused by the increasing abuse of the time, whether open or secret, shall we not ally our forces for scientific progress, for professional defence, for the general good?

Gentlemen of the Medical Society, I speak for the earnest men of my profession who, beset with temptations and difficulties, need and seek your co-operation; and the greatest good they can wish you is that you may worthily serve your chosen mistress. For the courtesies extended to our association through your delegates in the past, and for kindness shown the speaker at this and former meetings, the organized pharmacists of New Jersey bid me return sincere thanks.

AMERICAN PATHOLOGICAL NOTES.

By Albert S. Ashmead, M.D.,

New York.

I.

Pre-Columbian Surgery.

I have recently had occasion to observe a rare specimen of huacos pottery from Peru, representing a natural sized foot, swollen, with the bone protruding from the upper part, the flesh represented as if taken off to form a circular flap to cover the bone of the leg, from which the foot had been amputated. The intention of representing such a fact is unmistakable. This specimen belongs to the Bandelier collection; it shows, at any rate, that, at a very remote period, surgery was not contemptibly understood on this continent. Amputation at that time was done with a stone instrument, and yet I should think, by this representation, that the results were very fair.

Dr. Carl Lumholtz sent some cadavers of Tara-humare Indians, which he unearthed near Chihuahua, Mexico. They are certainly pre-Columbian. One of them is the skeleton of a very old woman, over 80 years certainly, so old that not only the alveoli of the upper maxilla,

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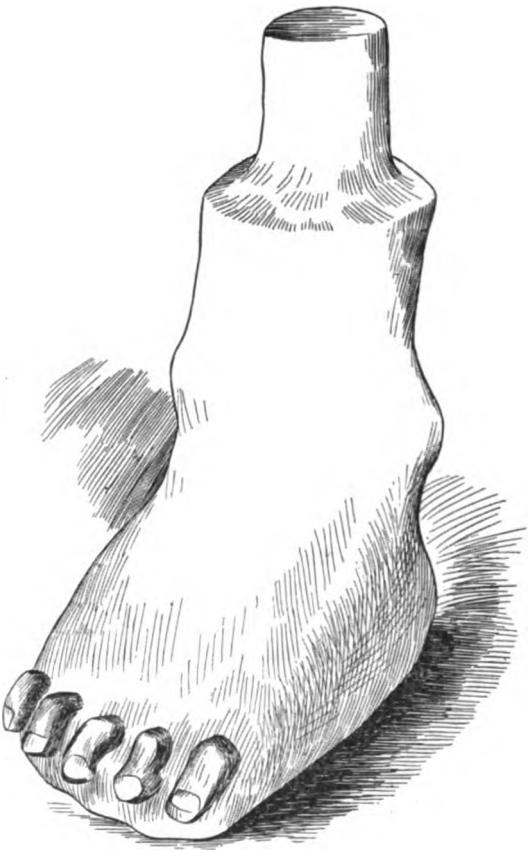
but this last bone, altogether up to a level with the nose, has been absorbed. Synostosis is general. In the anterior superior angle of the right parietal bone there is an irregularly round opening, an inch or more in diameter, showing the effect of trephining. The irregular rounding of the circumference shows that the operation was not made with a drill or a round saw. The operation took place a long time before death, as there is evidence of bony growth, bevelling of the



Huacos pottery, wine or water bottle, from pre-Columbian grave, Peru.

edges after the operation. There is no evidence of fracture. The instrument (which must have been a stone one, as iron came only with the Spaniards) did not entirely pierce the internal table, for there are some spicula of the internal table left around the lower circumference of the opening. This shows that these people understood the danger of injuring the dura mater, and that they knew that they must not go

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through the entire bone without precaution. The fact that the woman lived for some time after undergoing those woes proves that the surgery of the time was not bad. This is the only instance of trephining which has been discovered in the old land of Mexico. It offers to the surgeon a peculiar interest, because the cut is made circular, although not perfectly, as we make it now, and also not square, as it was mostly made in old Peru. (In Peru some are oval, some oblong.)

There is another specimen of a cadaver whose foramen magnum shows in the circumference where the second cervical vertebra, the axis, has been at some time dislocated, and the odontoid process has afterwards carved for itself a new opening or gap; a destruction of part of the bony structure, making a kind of gulf or bay or gap in the rim of the foramen magnum in one place. This gap is three-fourths of an inch in depth and a half inch in width, showing what one might call a false joint-opening for the odontoid. In this same cadaver, one femur represents fracture (diagonal) and repair, good repair, although the bone is about two inches shorter than its mate. Evidently the poor Indian (from synostosis, Professor Putnam thinks him to be 25 years of age) had fallen down a cliff, fractured his thigh, and dislocated his neck. What is most remarkable, he recovered from all these calamities, which proves again that, in those old times, they knew a great deal about surgery.

II.

Syphilitic Lesion Observed in a Pre-Columbian Skull.

In the Bandelier collection, American Museum of Natural History, New York, there is a skull of a mummy just being classified, from Pachacama, on the Peruvian coast, near Lima. It was found twelve feet underground, and no other part of the skeleton was in a condition to be shipped. It is without doubt, according to Mr. Saville, the director, and Professor Putnam, who examined it with me, pre-Columbian. In this burial-place, nothing modern, nothing post-Columbian has ever been found.

In the right supratemporal region of the skull, on the fronto-parietal suture, implicating both bones, there is mark of disease, one and a half inches in diameter. The bone is cancellated, eburnated, with deep corrugations, as if eaten by disease; the tissue is almost eaten through. But what is most peculiar is that a knife-mark, so fine that it can only be seen clearly with a glass, winds around the diseased spot. When held to the light and examined from the inside through the foramen magnum, this part of the skull appears extremely thin, the bone being almost entirely eaten through. No evidence of disease, except by this transmission of light, shows on the internal sur-

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face of the skull. Evidently an operation had been made on an ulcer or tumor of the scalp, a piece of scalp had been, perhaps, removed, and the instrument had left its mark on the bone beneath the periosteum; what followed we may guess; it was found that the skull itself was affected, and the case was left alone, and the man lived long enough to almost allow time to obliterate the mark of the surgeon's instrument. To my mind, this is an instance of syphilis in a pre-Columbian skull. The location of this lesion, and the appearance of the diseased bone throughout, are peculiarly syphilitic.[1] I have seen instances many times in Japan on the living body, and once in a post-mortem examination in a yosbiwara (licensed prostitute).

MEMORANDUM.

REPORT OF A CASE OF HEMIGLOSSITIS.

A YOUNG lad of 12 years, of excellent health, and free from any constitutional disease, called to consult me on account of acute inflammation of the tongue. It was in June, and he had been in swimming quite often, but had no cold or evidences of pharyngitis. One-half of the tongue was much swollen and tender to touch and painful on movement. The other half was quite normal. During the two days following the swelling increased until he could hardly swallow. There was no cellulitis of contiguous tissues and no glandular involvement. The pain was very great and the temperature above 102° F.

The constant use of ice during waking hours, and lead-water and laudanum compress during sleep, with laxatives, was the only treatment. In three days improvement began, and he rapidly progressed to recovery.

Cases of hemiglossitis are very rare. It is a very strange pathological condition to see such violent cellulitis and swelling with abrupt line of demarcation following exactly the median line of the tongue. Whether the cause was actual trauma or infection it cannot be said, but there was no evidence of either.

THOMAS HUBBARD, M.D.

TOLEDO, OHIO.

[1] See Exostosis and Caries of Os Frontalis; Caries and Necrosis of Os Frontalis, and others. Devergie's plates: Clinique de la Maladie syphilitique. Par M. M. Devergie, Paris, 1826.

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ALUMNI NOTES.

The Resignation of Dr. Harrison Allen.

At a meeting of the Trustees of the University, held on May 8, 1895, the resignation of Dr. Harrison Allen as professor of Comparative Anatomy and Zoology was accepted. Although the resignation was not altogether a surprise, the news was received with much regret.

Dr. Allen was born in Philadelphia in 1841, and graduated from the Medical Department of the University in 1861. From 1862 to 1865 he was assistant surgeon in the army, and was stationed at Washington, ranking as brevet-major in 1865. In 1865 he accepted the chair of Comparative Anatomy and Zoology in the Auxiliary Department of Medicine in the University, which position he held until 1878. In that year he became professor of Physiology in the Medical Department, holding the chair until 1883, when he was compelled to resign on account of the pressure of private work. Upon the death of Dr. Joseph Leidy, in 1891, Dr. Allen voluntarily tendered his services, and offered to furnish original research in anatomy to graduate students. He felt that there was no opportunity for students to acquire a knowledge of anatomy, except in connection with medicine, and through his efforts graduate students were given opportunities for deeper research in what Dr. Allen believed to be a branch of science as pure as mathematics or astronomy. In 1893 Dr. Allen accepted the directorship of the Wistar Institute of Anatomy, which had just been completed. After holding the position for one year, he found that it was too great an undertaking for a busy physician, and resigned in June, 1894. Dr. Allen was also visiting surgeon to the Philadelphia Hospital from 1874 to 1878, and assistant surgeon to Wills Eye Hospital from 1868 to 1870. He was professor of Anatomy in the Philadelphia Dental College from 1866 to 1878.

Dr. Allen's official connection with the University, lasting as it did thirty years, has been surpassed by but five professors: Alfred Stillé, M.D., LL.D.; Francis A. Jackson, A.M.; ex-Vice-Provost E. Otis Kendall, LL.D.; Peter Lesley, LL.D.; and Richard A. F. Penrose, M.D., LL.D.

Gifts to the University.

During the month of April gifts aggregating $36,388.30 were received by the University.

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The Annual Reunion of the Alumni of the Medical Department of the University of Pennsylvania.

The Twenty-fifth Anniversary Reunion of the Society of the Alumni of the Medical Department of the University of Pennsylvania will be held on Wednesday, June 12. The annual dinner of the Alumni will take place at the Bullitt Building, Fourth below Walnut Streets, at 8.30 P.M. All alumni of the Medical Department are cordially invited to attend, as every effort will be made to make this reunion noteworthy in every way and in keeping with the progress of the University. Appropriate toasts will be responded to by representative alumni.

The subscription price has been placed at $5, which should be sent to the Treasurer, Dr. Samuel D. Risley, 1722 Walnut Street, before June 5, in order to facilitate the work of preparation. Although a continual effort is being made to secure a complete list of the Alumni of the Medical Department, it has been found impossible to secure the correct address of many of the Alumni,—a fact which accounts for the frequent failures to receive invitations in former years. A special invitation, therefore, is extended to every University alumnus, whether a member of the Alumni Society or not, to attend the annual reunion.

The ballot for the election of officers and executive committee to serve for the ensuing year will be opened at Medical Hall, University of Pennsylvania, from 10 A.M. until 12 o'clock noon, on Wednesday, June 12, and again at the meeting in the evening. The annual business meeting of the Society will be held in a room adjoining the banquet-hall at 8 o'clock.

Committee of Arrangements: Richard A. Cleemann, M.D., chairman; Wm. Barton Hopkins, M.D.; H. R. Wharton, M.D.; Judson Daland, M.D.; Charles A. Oliver, M.D.; Joseph Leidy, M.D.; Elliston J. Morris, M.D.; Samuel D. Risley, M.D., treasurer; Joseph P. Tunis, M.D, secretary.

Improvements.

The Howard Houston Hall is rapidly nearing completion, and the contractors state that it will be ready for occupancy the latter part of September. The hall will add greatly to the appearance of the college campus, and will be the first of a series of new University buildings to be erected at an early date, prominent among which will be the new dormitories, the astronomical observatory, and the new archeological museums. Work on the dormitories will be begun in June upon the old athletic grounds. The new museum will be started soon thereafter.

The large ornamental and scientific botanical gardens, which will

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rank next to the famous Kew Gardens of London in beauty and area, and which will surround the Biological Building, are progressing rapidly.

The high iron fence at present surrounding the College, Medical and Dental Halls, Library and Mechanical Engineering Building, will be removed during the summer, and will be replaced by a low stone coping. The pavements in front will be replaced by asphalt. A row of white elms will tend to beautify the appearance of the campus.

Portraits to be presented to the Medical Department.

A portrait of the late Dr. William Goodell, painted by Vonnoh in oil, will be presented to the Medical Department of the University at the commencement to be held on June 13. The presentation address in behalf of the donors, Dr. Goodell's family, will be made by Dr. John Ashhurst, Jr.

On the same occasion a portrait of Dr. Horatio C. Wood, painted in oil by his son, Dr. James Wood, will be presented to the Medical Department of the University by the H. C. Wood Medical Society of the University.

Appointments.

At a recent meeting of the Board of Managers of the Methodist Episcopal Hospital Dr. Edmund W. Holmes was elected visiting surgeon.

Dr. Thomas F. Drown, of the Massachusetts Institute of Technology, and a graduate of the Medical Department of the University of Pennsylvania, has been chosen president of Lehigh University.

Necrology.

Dr. A. Rosewald Oppenheimer, of the class of '93, late resident physician at Johns Hopkins Hospital, died of typhoid fever a few weeks ago.

Dr. Joseph Rowland died in Media on April 29, 1895. He was in the eighty-first year of his age, and had been in active practice for fifty-five years. He was a graduate of the University of the class of 1840. He was widely known, and was held in high esteem both as a physician and as a citizen.

Dr. Isaac Wayne Hughes died in Philadelphia on April 26, 1895. Dr. Hughes was born at Gulf Mills, Montgomery County, Pa., sixty-three years ago. He graduated from the Medical Department of the University in 1852. He established himself in West Philadelphia and built up a large practice. He held a prominent place in both medical and financial circles.

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DR. W. MALLET-PREVOST died at Fresnillo, Mexico, on May 14, 1895. He was thirty years of age. He graduated from the Medical Department of the University in 1887, and after serving as resident physician to the University Hospital, he located in the City of Mexico, where in a short time he established a lucrative practice. He was also given charge of two hospitals, and was appointed surgeon-in-chief of the Mexican National Railway. On account of heart-disease he left the City of Mexico, the climate of which was unfavorable, and established himself in Fresnillo, which is in a lower altitude, and where he was joined by his father, Dr. Grayson Mallet-Prevost, who was with him at the time of his death.

DR. WILLIAM S. W. RUSCHENBERGER, the eminent naval surgeon and scientist, died on March 24, 1895, in Philadelphia, in his 88th year.

He was born in Cumberland County, N. J., September 4, 1807. After receiving an academic education in Philadelphia and New York schools, he entered the medical service of the United States navy as a surgeon's mate August 10, 1826.

His medical tutors were Dr. J. P. Hopkinson and Dr. Nathaniel Chapman, of the Medical Department of the University of Pennsylvania, from which he received the degree of Doctor of Medicine in March, 1830. He was commissioned a surgeon in the navy April 4, 1831, and from 1835 to 1837 was fleet surgeon to the East India Squadron, with which he circumnavigated the globe. In 1840–1842 Dr. Ruschenberger was attached to the naval rendezvous in Philadelphia. From 1843 he was superintendent of the United States Naval Hospital at Brooklyn, and during his term of service there organized the Naval Laboratory, for supplying the service with pure drugs. He was again fleet surgeon of the East India Squadron from 1847 to 1850, fleet surgeon of the Pacific Squadron from 1854 to 1857, and of the Mediterranean Squadron from August, 1860, to July, 1861, having served in the intervals between cruises at Philadelphia.

During the Civil War Dr. Ruschenberger was surgeon of the Boston Navy-Yard. From 1865 to 1870 he was on duty in Philadelphia. From 1866 to the time of his retirement, September 4, 1869, he was the senior officer in the Medical Corps, and March 3, 1871, he was commissioned Medical Director on the retired list, with the relative rank of Commodore.

Dr. Ruschenberger has been best known in Philadelphia, perhaps, for his scientific labors, and particularly for his efforts in behalf of the Academy of Natural Sciences, which bestowed on him the highest honors within its gift.

He was elected vice-president of the Academy in January, 1869,

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and president in December of the same year, serving in the latter office until 1881, when he was succeeded by Dr. Joseph Leidy. At the time of his death he was one of the curators.

Dr. Ruschenberger won considerable reputation by the results of his scientific observations during his various cruises, which he published at different times. Some of his works were "Three Years in the Pacific," "A Voyage Round the World," "Elements of Natural History," "Lexicon of Terms used in Natural History," "Notes and Commentaries During a Voyage to Brazil and China." Besides these, he wrote "A Notice of the Origin, Progress, and Present Condition (1852) of the Academy of Natural Sciences of Philadelphia," and various pamphlets on the rank of medical officers in the navy. He was also a contributor to the leading medical, pharmaceutical, and scientific journals.

Dr. Ruschenberger was also a member of the American Medical Association, the College of Physicians of Philadelphia, of which he had been secretary and vice-president; also a member of the American Philosophical Society and the Historical Society of Pennsylvania.

The Chinese Pharmacopeia.

Much has been written by travellers about Chinese medicines, usually in a spirit of ridicule, as if, though nothing else in their books should be provocative of mirth, this subject might confidently be relied on to raise a laugh. A common belief is that Chinese medicines consist almost entirely of mineral substances, the vegetable kingdom being little drawn upon. But the opposite is the case. In Mr. R. Braun's work, "A List of the Chinese Medicines Exported from Hankow and the other Yangtze Ports," which contains the names of most of the medicines in use in the central parts of China, there are 412 medicines, classed as under: Insects, 9; roots, 113; barks and husks, 25; twigs and leaves, 16; flowers, 21; seeds and fruits, 93; grasses, 18; sundries, 117.

Ichthyol in the Treatment of Erysipelas.

Zelewsky has found ichthyol efficacious in every form of erysipelas, and in his opinion it is superior to other remedies. In some cases of migratory erysipelas affecting both sides of the patient's body, he painted one side with Trousseau's solution (acidi tannici, camphoræ, āā 2.0 grammes,—31 grains; æther. sulph., 15.0 grammes,—3¾ fluid-drachms), and the other with ichthyol, the morbid process subsiding much more quickly under the latter treatment than under Trousseau's solution. He prescribed the drug as follows: Ammon. sulpho-ichthyol, spir. æther., āā 1 part; collodi. elastici, 2 parts.—*Iugno-russkaya medic. gazetta.*

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EDITORIAL.

CARBOHYDRATES IN DIABETES.

THE injunction to eliminate from the dietary of diabetic patients all saccharine and amylaceous matters has been so thoroughly inculcated that we fear a too strict adherence to the prescribed regimen has sometimes resulted in harm rather than good. The practice, not uncommon, of furnishing the patient with two printed diet lists, the one of admissible and the other of prohibited foods—simply directing him to use the former and to abstain from the latter, without reference to the quantity and digestibility of those foods which are admissible—is certainly injudicious. Sydenham's advice: "Let the patient eat food easy of digestion, abstaining from all sorts of fruits and garden stuff," is not always followed in its entirety. In diabetes the appetite is often inordinate, while the digestion is weak, and under these circumstances the ingestion of large quantities of albuminous food may be fraught with danger to the patient. The value of a given dietary should always be determined not only by the quantitative estimation of the glycosuria, but also by the influence on the digestion, general health, and body-weight.

Further, Ebstein (*Medical Chronicle*, Vol. XVI, No. 6), in an article dealing with this subject, remarks that purely albuminous food cannot be tolerated for a long time by the diabetic patient, and that the more severe the disease the greater the dangers from such a diet. This danger is recognized by the appearance of diacetic acid in the urine. Ebstein never introduces the diabetic diet suddenly, but gradually, especially so when the disease is a serious one. Rolfe (*Lancet*, April 23, 1892) also believes that the advantages resulting from a strict adherence to an absolute diet of proteids may sometimes be gained at too great an expense to the patient's well-being, since the too long continuance of such food may prove dangerous by causing the formation in excess of bodies such as the morbid products of proteid metabolism, and that some benefit may be derived in other directions by permitting a slight relaxation from too rigid a proteid dietary. In the early stage of the disease, when the health is still vigorous, the digestion good, and the excretory functions adequate, the danger is at a minimum; but later, when the general health fails and the digestive

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powers become impaired, a toxemia may develop from the accumulation of the products of faulty metabolism.

Grube (*Lancet*, Vol. II, 1893) states that in his opinion it is a mistake to treat patients too one-sidedly, and to think that the chief part of the treatment is to prohibit the ingestion of carbohydrates. The importance of this treatment, he continues, is not to exclude the carbohydrates entirely, but to induce the patient's system to utilize them again. He also points out that in advanced cases diabetic coma, when imminent, can be averted by giving carbohydrates.

Pavy ("Croonian Lectures," *Lancet*, Vol. II, 1894) says that in proportion as the power of properly disposing of carbohydrate matter becomes restored, a more liberal diet is found not only to be tolerated but to be required, and that when a recovery of assimilative power has taken place, a continuance of the restricted diet is attended with a fall of weight and a decline of strength. Saundley (*Lancet*, Vol. I, 1894), in an address before the Eleventh International Congress of Medicine at Rome, remarked that in the future we should reverse the fundamental rule that diabetics should be allowed as little carbohydrates as possible, and declare that they should be permitted to eat as much carbohydrates as they can assimilate without increasing their sugar secretion. He has found from experience that the majority of patients can take a moderate amount of carbohydrates without injury, and he maintains that this method is very much better for the patient and affords a *régime* which it is possible for him to conform to. Schmitz (*Centralbl. für Nerv., Psych. u. gericht. Psycopath.*, No. 27, 1893) insists that large quantities of meat in grave types of diabetes decidedly augment the amount of sugar in the urine, a fact confirmed by Nannyn and others. He therefore limits the amount of meat in grave cases, and allows a varied diet, and especially fat.

It is well known that all carbohydrates do not act the same in diabetes; indeed, some seem to be quite free from deleterious effects. The employment of an exclusive milk diet, suggested by Donkin and advocated by Tyson in certain cases, often acts most happily, although milk is rich in lactose.

Minkowski (*Archiv. für exp. Path. u. Pharm.*, Vol. XXXI, 1892) draws attention to the changes of various carbohydrates in diabetic animals. He shows that levulose in small doses is lost in the organism, and that only minute quantities appear in the urine. On the other hand, inulin causes a marked increase in the glucose elimination. When levulose is administered in large doses, a portion is excreted unchanged, while a part is converted into dextrose.

Of late, considerable testimony has been advanced showing the value of levulose in diabetes, both as a food and as a sweetening agent.

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Levulose or fruit-sugar is an uncrystallized sugar found in honey and the juices of fruits. The French speak of it as invert sugar, because it has a rotating power to the left instead of to the right like glucose and cane-sugar.

Leyden (*Deuts. med. Zeit.*, p. 498, 1893) found that the addition of six to seven drachms of levulose to the diet increased but slightly the amount of sugar in the urine, and infers that this sugar is better adapted than any other for use in diabetes.

Haycraft (*Medical Chronicle*, September, 1894), from experiments and observations made on three patients with diabetes to whom levulose was administered, draws the following conclusions: (1) A patient suffering from chronic diabetes can utilize fifty grammes or more of levulose daily. (2) In some acute cases a part of the levulose taken with the food is excreted as such, a part is utilized in the body, and a part is transformed into glucose. (3) In rabbits glycogen is formed from the levulose taken, and is stored up in the liver. W. Hale White (*Guy's Hospital Reports*, Vol. I, 1893) reports the results of a number of careful experiments on eight diabetic patients with regard to the effect of giving levulose. He concludes that if large amounts are administered, some of it appears in the urine; that it does not exert the pernicious effect of some carbohydrates of increasing the output of sugar beyond the extra quantity given; that some of the levulose was retained and used up in the body. None of the patients felt worse for taking the levulose; indeed, some felt better and gained in weight. Grube (*Zeit. für innere Med.*, Bd. XXVI, Hefte 3 u. 4), from experiments on seven cases, reaches similar conclusions to those of White.

If further research should confirm the truth of these statements, levulose will fill a long-felt want in the treatment of diabetes, not only as an assimilable carbohydrate, but as substitute for glycerin and sugar, which as sweetening agents have been far from satisfactory.

Serum Treatment of Cholera.

Freymuth (*Deutsche medicinische Wochenschrift*, October 25, 1894) has treated three cases of undoubted cholera by the injection of serum obtained from patients who had recently passed through an attack of the disease. Of these three cases, two recovered. In the fatal case, death was due to a mixed infection, as the bacteriological examination showed. In one case particularly the patient rapidly improved after the injection. The serum was used in doses of ten, thirty, or even fifty cubic centimetres. It was shown to protect guinea-pigs against injections of virulent cholera bouillon. The treatment is easily carried out, and is without danger. The serum should be taken from those who have had a severe attack of cholera.—*British Medical Journal.*

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MEDICAL PROGRESS.

MEDICINE.

UNDER THE CHARGE OF

WILLIAM PEPPER, M.D., LL.D., AND JAMES TYSON, M.D.,

ASSISTED BY

M. HOWARD FUSSELL, M.D.

THE INFLUENCE OF THE LIVER IN THE PRODUCTION OF PANCREATIC DIABETES.

MARCUSE (*Zeitschrift für klinische Medicin*, Vol. XXVI, Parts 3 and 4, 1894), endeavoring to demonstrate that following pancreas extirpation diabetes may also occur in cold-blooded animals, removed the pancreas from each of nineteen frogs. The animals lived from two to eighteen days, twelve became diabetic, the second day following the operation at the latest, the urine containing a few tenths per cent. of sugar. He then removed from twenty-one frogs both the liver and the pancreas, and although the majority of the animals lived some days, in none did sugar appear in the urine. The supposition is that by the extirpation of the liver, there is removed the source whence springs the sugar following pancreas extraction. An absolutely satisfactory explanation of the phenomenon is, at present, not to be given.

THE PREPARATION OF "FATTY MILK."

GAERTNER (*Wiener medicinische Wochenschrift*, No. 44, 1894) describes his method, whereby it is possible, from cow's milk, to prepare a milk, which, in its proportion of casein and fat, resembles human milk. It is also possible to prepare the milk so that it may contain any desired quantity of casein or fat. This is effected by means of a centrifuge (Pfannhauser's), the barrel of which is provided with two outlets, one on the side, the other, a tube, which may be introduced into the barrel to any desired extent. They are in this case so arranged that the outflows through each opening may be equal. The milk is diluted with an equal quantity of warm water and subject to centrifugation. The lighter fat drops tend towards the centre, the heavier constituents, including various foreign matters, dirt, etc., towards the periphery. The distribution of the casein, sugar, and salts is not influenced. The milk—the "fatty milk"—which one obtains through the more centrally located opening contains therefore (1) all of the fat (a very small quantity only being lost in the "thin milk"); (2) half of the casein; (3) half of the sugar, and half of the salts. Excepting the smaller amount of sugar, which can be corrected by the addition of a litle milk-sugar, this "fatty milk," in all essential particulars, resembles human milk. One obtains after centrifugation exactly the same quantity of milk as originally used. There is, therefore, no waste. After centrifugation, the milk is allowed to cool or can be sterilized.

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Treatment of Furunculosis by Colchicum.

Brocq (*Journal de Médecine et Chirurgie pratique*, February 10, 1895) remarks that gouty patients who have neither diabetes nor albuminuria are frequently troubled with furunculosis. This condition is best treated by the prolonged use of the extract of colchicum of three to four centigrammes daily. He cites the following case: A man, aged 40 years, had suffered for several months from a furunculosis, which had resisted all treatment both internal and external. After five days' treatment with colchicum the furuncles were arrested, and no new ones developed. Cessation of the treatment was followed by a fresh outbreak of the boils. They were again arrested by continuation of the treatment. It was found that if the treatment was continued for a long time and the dose gradually diminished that the boils did not reappear. At the same time the whole body was bathed daily in camphorated alcohol.

Gaertner's "Fatty Milk," a New Method of Infant Feeding.

Escerich (*Wiener medicinische Wochenschrift*, No. 44, 1894) makes mention of the fact that of all the methods tried to provide a substitute for mother's milk for infants, none have proven satisfactory. There is one exception—Gaertner's "fatty milk." This was given to a number of children. It was always taken with relish. The stools were rather frequent than otherwise, of slightly acid reaction, soft, fatty, shining, and contained small flakes. Microscopically there were a number of bacilli, not decolorized by Gram's method. There was never that obstinate constipation with hard feces which so often accompanies feeding with diluted cow's milk. The increase in weight of the children was progressive and exceeded that of other artificially fed children. In the treatment of disorders of digestion the "fatty milk" was not of such avail, the reason to be sought more in hygienic mismanagements than in the milk. The milk is warmly recommended.

Hematuria of Gout.

Mabboux (*Lyon Médical*, March 3, 1895). An attack of renal gout consists anatomically in hyperemia, but there is not of necessity hematuria. The appearance of albumen in the urine or its sudden increase, whether or not it is coincident with articular pain but accompanied with tenderness in the loins, is most frequently due to an attack of renal gout. These attacks are to be distinguished from renal colic due to calculi. Some attacks of hematuria occur without pain or preexisting hematuria. Renal gout occurs in females quite as frequently as in males.

Gouty hematuria is practically always renal in origin, as attacks of cystic gout resemble those of an ordinary cystitis, and a urethral gout possibly does not exist. In neither of the last instances are the blood and urine intimately mixed. Gouty renal colic may occur suddenly or after some days of lumbar pain. It often is the first expression of the diathesis in individuals of full habit without any genito-urinary disease; it is frequently accompanied by a chill; it is not influenced by walking or jolting; the pain is always bilateral, and the passage of the bloody urine is not painful. Its duration is variable; it may last from a few hours to several days. Sometimes there are a series of attacks lasting over several days. The urine frequently contains considerable renal epithelium in addition to the blood, and contains albumen in excess of the amount of blood, which continues after the blood has disappeared. The pain is not frequently acute nor sharp, as it is in stone.

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Some Researches into the Chemistry of Typhoid Fever.

Fenwick and Bokenham (*British Medical Journal*, April 13, 1895), in their report to the scientific Grant's Committee of the British Medical Association respecting the pathologic effects of certain chemical substances extracted from the spleen of patients dying during the third week of typhoid fever, came to the following conclusions:

(1) Three varieties of chemical substances can be extracted from the spleen after death from enteric fever during the third week of the disease,—albumoses, alkaloids, and fatty bodies.

(2) The injection of the albuminous extract into lower animals causes an elevation of the temperature of the body, which lasts for about thirty hours, and is associated with anorexia and emaciation. Under ordinary circumstances a fatal result is not observed, and no pathological changes of importance are to be detected in the tissues.

(3) The administration of the alkaloidal and fatty extracts is unattended by any pathological results.

Observations on the Blood in Disease.

Zappert (*Zeitschrift für klinische Medicin*, xxiii, parts 3 and 4) has examined blood with a 1-per-cent. solution of osmic acid and a solution of eosin in water and glycerin with the following results: In healthy individuals, between 20 and 70 years of age, the eosinophile cells vary from 50 to 270 to the cubic millimetre. In some entire normal individuals the number is as great as 700 to the cubic millimetre. In children's blood the eosinophile cells are always numerous. Menstruations and pregnancy do not increase these cells. In leukemia the eosinophile cells are absolutely increased. In chlorosis and other anemias sometimes there was an increase, sometimes a diminution of these elements. Heart-failure did not alter the number. In diseases of the stomach and intestine the numbers varied. In diseases of the liver there was frequently an increase. In cases of tuberculosis of the lungs with fever there was frequently a decrease, while bronchial asthma and emphysema were always accompanied by an increase. In nephritis the number is great, independent of uremia. In functional nervous diseases the number is increased, but not enough to make a differential diagnosis. In diseases of the skin and syphilis they are usually increased. In malignant tumors there is usually a decrease. In febrile diseases there is a decrease at the height of the fever; in scarlet fever the cells are increased.

Bücklers (*Münchener medicinische Wochenschrift*, 1894, Nos. 2 and 3), on the increase of eosinophile cells with the presence of Charcot's crystals in feces of patients with worms, found a very usual increase of the cells. This increase was coincident with the appearance of Charcot's crystals in the feces.

Kanthack (*British Medical Journal*, July, 1892) has found eosinophile cells in eczema, prurigo, and asthma, and believes they are not characteristic of leukemia or pseudo-leukemia.

Ewing (*New York Medical Journal*, December 16, 1893). In most cases of lobar pneumonia there is a decided leucocytosis, and the grade is proportionate to the extent of the pneumonia. In cases of acute tubercular pneumonia there is *no* leucocytosis nor is there in typhoid fever. In empyema and actinomycosis of the lung there is a leucocytosis. Marked leucocytosis is in favor of pneumonia where the question is between this disease and typhoid. A severe leucocytosis in pneumonia is not always a favorable sign, while a small degree in a severe case of pneumonia is of bad prognostic import.

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A New Method of General Narcosis.

Rosenberg, in the Berlin Medical Society (*Deutsche medicinische Wochenschrift*, No. 50, 1894), described a new method for inducing general narcosis. Before commencing the anesthetic, the patient's nasal mucous membrane is to be sprayed with a ten-per-cent. solution of cocaine. During prolonged anesthesia, the spraying is to be repeated every thirty minutes, and again at the end of the operation, no matter how short. His conclusions are: (1) excluding cases of negligence and of poisoning, cardiac syncope in chloroform narcosis is, in so far as it can be attributed to the chloroform, reflex. (2) The syncope and the accompanying respiratory embarrassment are due to irritation of the peripheral trigeminal filaments in the nasal mucous membrane. (3) Every anesthetic inhaled produces the same reflex symptoms as chloroform. (4) By proper cocainization of the nasal mucous membrane, all such reflexes can be positively prevented. (5) Thus a greater part of the dangers of inhalation anesthesia, particularly of chloroform, can be removed. (6) Cocaine possesses a certain action antidotal or antitoxic to chloroform, and thus further reduces the dangers of chloroform. (7) Chloroform in such cases is to be preferred to ether, as being less dangerous. The chloroform must always be administered drop by drop.

Renal Complications of Typhoid Fever.

Roth (*Münchener medicinische Wochenschrift*, No. 11, March 12, 1895) cites a number of statistics in relation to the frequency of nephritis as a complication of typhoid fever. He mentions the observations of Mygge, who, systematically examining the urine of seventy-two typhoid fever patients, found albumen present in fifty-two. In half of these cases it was due to nephritis, in the other half to pyelitis or to cystitis. He refers particularly to cases in which the renal symptoms may be much more marked than those referable to the gastro-intestinal tract, and cites a case of a boy taken suddenly ill with headache, thirst, fever, and pain in the right loin. On admission, fourth day of disease, the urine was scanty, dark-red, cloudy, contained considerable albumen, epithelial cells, numerous white blood-corpuscles; no casts. On the eighth day roseola were found; on the ninth day the spleen was palpable; the urine contained albumen and epithelial cells from the pelvis of the kidney; no casts. The disease thus began as a pyelitis; it being only on the eighth day that the diagnosis of typhoid fever could be made. The constant absence of casts argued against nephritis. The patient recovered. Careful examinations will prevent the overlooking of pyelitis occurring during the course of typhoid fever, but in cases beginning as pyelitis the diagnosis may be obscured. Unless absolutely necessary in such cases the cold bath should not be used. During convalescence, great care must be exercised regarding the diet, especially in the use of albuminous foods.

The Relation of the Pancreas to Diabetes.

Hansemann (*Zeitschrift für klinische Medicin*, Vol. xxvi, Parts 3 and 4) sees no reason why the results of experimentation on dogs whereby diabetes follows pancreas extirpation cannot be applied to man. On the one hand, none of the nineteen cases of disease of the pancreas without diabetes which he reports is free from objection; and, on the other, there are numerous positively proven cases of disease of the pancreas with diabetes. Of these latter he reports forty cases from personal observation, and seventy-two from the literature of the subject. (1) Dia-

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betes without disease of the pancreas; not discussed. (2) Disease of the pancreas without diabetes. With the formation of calculi in the pancreatic duct, lipomatosis, sclerosis, and cysts, there is always a portion of the glandular substance of the organ remaining; therefore no diabetes. It requires the most careful examination to reveal these small portions. Acute inflammation, suppuration, and necrosis of the entire organ do not lead to diabetes, probably because death occurs too soon. The diffuse carcinoma affects, indeed, the entire organ, but as the cancer cells originate in the pancreatic cells, it is possible that they can continue to exert their antidiabetic action, although they have lost all secretory function. (3) Disease of the pancreas with diabetes. Of the forty cases of personal observation, thirty-six were of simple atrophy, three of fibrous induration, one a complicated case. The disturbance in the pancreas corresponded to no particular form of diabetes; twenty-six patients were very much wasted, three moderately so, seven were well nourished, and of four the condition of nutrition was not known. Twenty-two died in coma; eighteen under other symptoms. It is not so much the nature of the disease of the pancreas, as it is the extent of the degeneration of the organ that determines the diabetes. To this there is one exception, the genuine granular atrophy of the pancreas which from the beginning produces a diminution of the antidiabetic action of the pancreatic cells, and of necessity leads to diabetes.

Nephritis without Symptoms.

The urine of all patients applying at this department for treatment is examined whatever the nature of the complaint from which they suffer. (*From the University Medical Dispensary,—service of* M. Howard Fussell.) While it is a well-known fact that serious kidney lesions can exist without giving rise to any symptoms whatever, these cases are published as showing the necessity of a *routine* urine examination if we would make ourselves certain in our diagnosis. And while it is not literally the fact that all the cases were without symptoms, they either did not complain of their serious condition, or the symptoms of which they complained would not have suggested a urine examination.

Case I.—John ——, aged 32 years, applied at the Medical Dispensary for relief from swollen cervical glands. He denied all symptoms except a slight pain in the inflamed gland. A physical examination was made (as is done in all cases however apparently trivial their complaint). The pulse was feeble, and there was a tendency to cyanosis. The cardiac dulness was greatly enlarged, with the heart apex in *fourth* interspace inside midclavicular line. There was an evident pericardial effusion. The urine was examined and found loaded with albumen and casts. The patient was warned of his condition, but never returned for treatment.

Case II.—Emma P., aged 9 years, a private patient, was seized with slight nephritis, low grade of fever, and swollen cervical glands. Just such a picture as is constantly seen in children with catarrhal affections. An examination of urine was made, and it was found to be diminished in quantity and to contain large quantities of blood, blood-casts, and granular casts.

The patient was at once put on proper treatment and improved, but at this date, three years after the onset, casts and albumen may be found constantly in the urine. The patient grows, is florid, and the picture of perfect health. Nevertheless, the serous renal complication still exists.

Case III.—John G., aged 61 years, came to the Medical Dispensary November 28, 1894, complaining of cramp-like pains in the calves of both legs, which pains had existed more or less constantly for a period of fifteen years. Physical exam-

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ination revealed slight atheroma of the arteries. There was some slight increase in the area of heart dulness; and the lungs were normal. The examination of the urine on this date was negative. The urine was again examined on December 19, 1894, and the following note made: specific gravity 1008, reaction acid, albumen a trace, and a few hyaline casts. The urine has been examined at intervals of a week or ten days up to the present time, and with two exceptions albumen and casts (granular and hyaline) have been found. Under appropriate treatment the cramps have disappeared and dyspnea, a symptom, developed, which also has disappeared. The muscular cramps are looked upon in this case as a symptom which, in reality, were renal in origin and which have been relieved by treatment directed to the kidneys.

CASE IV.—Fred. ——, aged 32 years, presented himself suffering with an arthritis of wrist joint. No other complaint was made nor could any symptoms be developed upon careful questioning. Urine examination on two occasions showed considerable albumen with granular and hyaline casts. The arthritis was cured and the patient passed from observation, the last urine examination showing the same condition of kidneys.

CASE V.—A. G., aged 36 years, presented himself suffering from hemoptysis, cough, and profuse expectoration with night-sweats. Physical examination revealed a marked consolidation at right apex. The heart-sounds were weak, no enlargement of organ, nor murmurs. Examination of urine showed it to contain one-half by bulk of albumen with dark granular casts. The casts and albumen presented up to the last examination on March 19, 1895. The condition of the kidneys necessarily must have an effect upon the prognosis and treatment of the case, and it would have been a grave error to have overlooked it.

CASE VI.—Benj. G., aged 41 years, applied for treatment January 15, 1895, complaining of pain in hip-joints, in lumbar region, and in the testicles. Physical examination showed a slight accentuation of the second sound of heart. The lungs normal. Urine, specific gravity, 1018, acid, a trace of albumen, with pale, granular casts. Several subsequent examinations showed the presence of albumen and casts, both of which have disappeared under treatment. Unquestionably, the symptoms here complained of were due to a slight renal lesion which has apparently recovered.

CASE VII.—Howard S. presented himself for examination because, on the previous day, he had been rejected by a life insurance society. A physical examination of heart and lungs showed them to be normal, but the urine contained one-fifth albumen and numerous casts. He came simply for an opinion and passed from under observation.

CASE VIII.—Henry N., aged 23 years, came February 2, 1895, complaining of severe epigastric pain, and numerous nervous phenomena, none of which would have suggested a kidney lesion. The heart and lungs were normal, a slight epigastric tenderness existed. The man was and still remains the picture of health, but the urine contains a large number of granular and blood-casts with about one-fifth albumen. It is unnecessary to say that the treatment in this case is entirely changed by reason of knowing the urine conditions, and though the patient may, perhaps, not be cured, he certainly can be treated rationally.

All the urine examined was treated by the centrifugal machine. This instrument gives results far more satisfactory than the usual method of allowing the urine to stand twelve to twenty-four hours. Not only can the urine be examined fresh, but the sediment is concentrated, and casts can frequently be found which would almost certainly be overlooked in the older method.

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SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

ASSISTED BY

G. G. DAVIS, M.D., M.R.C.S., AND ELLWOOD R. KIRBY, M.D.

A Case of Pancreatic Cyst treated by Drainage; Recovery.

Richardson (*Boston Medical and Surgical Journal*, March 21, 1895) reports the case of a man, aged 26 years, who had always been well and strong up to his present illness. He first noticed a painless swelling in the pit of the stomach, about six weeks before the operation. This swelling gradually grew larger, and became so painful that he could not sleep at night.

The pulse, temperature, and urine were normal. On examination the tumor was found large enough to interfere considerably with respiration, and distended tensely the upper half of the abdomen.

A diagnosis of cyst of the pancreas was made from the position, and an incision made from the ensiform to the umbilicus, the omentum being carefully separated, the tumor was brought into view and the contents aspirated.

The fluid was viscid and of a dirty-gray color.

About two pints of fluid were withdrawn by the aspirator. The parts about the exposed portion of the tumor were then walled off with gauze, a free opening was made, and about two quarts of fluid escaped.

Exploration with the finger revealed a large cavity in the retroperitoneal space.

On account of the great number of adhesions, the sac could not be removed.

The cyst-wall was then sutured to the abdominal wound and a large drainage-tube inserted.

The author says in the surgical treatment of these conditions, the important question to decide is between drainage and radical removal of the sac.

Numerous observations show that complete healing usually follows simple drainage of the sac.

An Operation for the Relief of Impermeable Occlusion of the Esophagus.

Bernays (*New York Medical Journal*, March 23, 1895) reports the case of a child, aged 6 years, with the following history: When two years old she swallowed concentrated lye. The accident was discovered immediately after its occurrence, and prompt medical assistance given; great edema of the parts followed, and for a period of four days was unable to draw the tongue into the mouth.

When the local swelling and edema had subsided, she was found to be unable to swallow.

No attempt was made to prevent the formation of a structure until four months afterwards.

Many attempts were made to pass bougies, but only a few of these trials were successful.

No further attempts were made to relieve the stricture until fourteen months afterwards.

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Gastrostomy was then performed and the patient nourished through the fistulous opening.

At the time the patient was etherized the fistulous opening into the stomach was dilated and the cardiac end of the esophagus explored, but no structure could be found. A soft metallic sound was introduced through the stomach into esophagus so as to locate the lower margin of the structure. A bougie was introduced through the mouth and found to stop at eighteen centimetres from the teeth.

At the first operation a metal male catheter was introduced into the esophagus and pushed forward and to the left of the trachea, until the point could be felt immediately beneath the skin. An incision was then made in the neck, the esophagus opened, and stitched to the skin wound.

At the second operation, three weeks later, the finger was introduced into the esophagus through the opening in the neck.

A bougie, with a point like a trocar, was introduced into the esophagus through the gastric fistula and pushed through the structure to the finger above. It was pushed up into the wound in the neck and a stout silk ligature attached and pulled out at the gastric fistula.

A Nélaton rubber catheter was fastened to this ligature (external diameter one and a half centimetres). This was drawn through the esophagus until the upper end had entered the neck, and then pushed upward until the upper end could be seized in the pharynx and drawn forward out of the mouth; both ends of the catheter were now outside of the body; they were sutured to the ligature, the ends of which were tied together.

On the seventh day a Renvers funnel was introduced over the catheter as a guide down through the stricture, and the catheter then removed through the gastric fistula.

Fourteen days later the funnel was removed and patient allowed to swallow naturally.

At this date patient has bougie regularly passed every second or third day.

Observations on a Further Series of Relapsing Typhlitis treated by Operation.

Treves (*British Medical Journal*, March 9, 1895) reports a series of eighteen cases treated by operation. In all cases the appendix was removed only when all inflammatory symptoms had disappeared. All the cases but one recovered from the operation.

It has been now apparently demonstrated that the form of localized peritonitis, which is known by the names of typhlitis, perityphlitis, and appendicitis, is due in the great majority of instances to the bacterium coli commune.

This organism exists normally in the human body, and is said to be the most abundant and the most constant of the bacteria found in the healthy individual.

The organism varies greatly in its virulence; so far as experiments show upon animals it appears to be harmless when taken from the normal intestine. Virulence has been found to be developed in cases in which the bowel was obstructed, strangulated, congested, or inflamed, in diarrhea and in advanced constipation.

Two elements, at least, would appear to be necessary to produce an attack of localized peritonitis through the medium of the appendix. The first is such a condition within the bowel as will render the colon bacillus virulent, and the second is such a lesion in the appendix as will permit that organism to reach the peritoneum.

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The invasion of the peritoneum by organisms gives rise to sudden violent and acute symptoms, to an outbreak so abrupt and intense as to produce the impression that the appendix has become perforated. Perityphlitis, due primarily to a sudden definite perforation of the appendix, is certainly uncommon.

If a large series of cases of this affection be reviewed, it will be found that the number of instances in which there is only one attack is much greater than that in which there have been several attacks.

In a certain proportion of the examples of a single attack there has been an abscess, and the great majority of the subjects of typhlitis who have passed through the stage of suppuration are thereby rendered free from any further attacks. The cause of the trouble has been removed by the suppurative process.

Among the marked conditions of the appendix necessary to cause relapse, the following are probably the most common.

The lumen of the appendix is in some places narrowed or occluded. Such occlusions may result from a husky or an acute tending.

Occasionally the organ shows a condition well adapted for volvulus, or there is lodged with it fecal or calcareous concretions.

As to the treatment of these conditions the author recommends the following, when the cases are very mild:

(1) The digestion must be well attended to.

(2) The bowels must be made to act daily, the aperient given should be frequently changed.

(3) Massage of the abdomen appears in many cases to have a very desirable effect, partly by favoring the absorption of inflammatory exudate, and partly by encouraging a normal action of the bowel.

(4) The use of some intestinal antiseptic, the most efficient of which appears to be salol.

It should be given in a powder, ten grains night and morning.

THERAPEUTICS.

UNDER THE CHARGE OF

HORATIO C. WOOD, M.D., LL.D., AND ARTHUR A. STEVENS, M.D.

THE INFLUENCE OF HIGH ALTITUDES ON THE BLOOD.

THIS subject is reviewed at some length in the *Archivio di Farmacolgio e Terapeutico*, for January, 1895.

Vrault found, during his travels in Bolivia and Peru, that the indigenous men and animals of those high altitudes had an abnormally large number of red corpuscles to the cubic millimetre. He found that in himself and a companion the number of red corpuscles rose to 8,000,000 after a stay of three weeks at an altitude of 4392 metres. The llama, with its 16,000,000 globules to the cubic millimetre, is the animal *par excellence* for high altitudes.

Koepe and Wolff counted the red blood-cells of people at Leipsic, and then each day of their stay at Reiboldsgrün, at an altitude of 700 metres. In the city the average was 5,000,000 red corpuscles to the cubic millimetre. On the first day

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at Reiboldsgrün there was an increase to 5,970,000; on the second day a fall almost to normal; on the third day another increase, and this was permanent; on the fifth day 6,000,000; on the sixteenth day 6,200,000.

Karcher observed in himself, at Champry, altitude 1052 metres, after twenty-one days, an increase of 15.7 per cent. of red cells, and in others an increase of 9.3 per cent.

Suter, at 985 metres, and Veillon, at 700 metres, observed an increase of 19.5 per cent. and 7.7 per cent. respectively.

Mercier, of Zurich, draws the following conclusions:

(1) The greater the altitude at which man lives the greater the number of red cells in the unit of volume.

(2) The number of red cells increases proportionately to the altitude.

(3) The increase is characterized by the new formation of cellular elements of less volume.

(4) This ascensional polycythemia (Mercier) or hyperglobulia (Vrault) diminishes as man lives in a region less elevated.

(5) This increase has been noted in all, and is independent of individual peculiarities, age, sex, health, sickness, occupation, or social state.

(6) This change in the blood constitutes a physiological phenomenon of man's adaptability to a different environment (Translated by James J. Walsh.)

The Bactericidal Action of Fluoride of Silver.

Lazzaro (*Archiv. di Farmacol. e Terapeut.*, January, 1805) says that the well-known instability of the salts of hydrofluoric acid, and the intense affinity of the acid for oxygen give them an energetic antiseptic action. Fluoride of silver seems to be the most powerful of them, but the high price and instability of the salt will keep it from general practical use as a disinfectant. In malignant pustule, however, Lazzaro thinks that it will prove of more avail than any other antiseptic. (Translated by James J. Walsh.)

Physiological Action of Cadmium.

Paderi (*Archiv. di Farmacol. e Terapeut.*, January, 1895) says that cadmium occupies in Mendelejeff's periodical system a place that corresponds to that held by zinc and mercury. The chemical analogy existing between the metals extends also to their therapeutic action, although this is not always the case. Toxic doses of cadmium produce about the same effects on frogs, birds, dogs, and rabbits,—progressive weakness, a tendency to somnolence, slowing of pulse and respiration, and death without convulsions. Chronic poisoning leads to rapid emaciation, complete paralysis, and death with the heart arrested in diastole. The drug exerts but a slight action, if any, on the peripheral nervous system. As regards the centric nervous system, it first affects the cortex, but before this has been completely paralyzed, the functions of the medulla are interfered with, and the animal dies from arrest of respiration. The heart is affected centrically, and also by the direct action of the drug on the cardiac muscle. The muscles of an animal poisoned by the metal retain their excitability for a long time. In small doses cadmium acts on the digestive tract as an astringent, but in large doses it excites peristalsis and causes diarrhea. In all the poisoned animals, congestion or inflammation of the kidneys was found after death. Injected hypodermically it produced intestinal ulceration. Its antiseptic action is greater than that of zinc and less than that of mercury. (Translated by James J. Walsh.)

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The Climatic Treatment of Graves's Disease.

Glax (*Wiener medicinische Wochenschrift*, March 2, 1895) reports five cases of Graves's disease which were greatly improved by the mild sea-air of Abbazia. Four of these patients were from 25 to 35 years of age, the remaining one being 50. In one case the exophthalmos and enlarged thyroid were particularly marked, whereas in the remaining cases the cardiac symptoms or tremor were prominent. In two cases the heart-beat was 120 to 140 per minute, and there was evidence of cardiac dilatation. The tachycardia quickly diminished, and the cardial dilatation disappeared; the general condition improved, and there was considerable increase in weight.

Neurodin.

Ugo Lippi (*Il Policlinico*, February 15) gives an account of some experiments made by him with neurodin, an analgesic introduced by Von Mering (*Therapeutische Monatschrift*, 1893, p. 582). The cases in which the drug was tried were fourteen in number, and are classified as follows:

(1) Experiments on persons not suffering from pain, made in order to determine the limits of tolerance of the drug, and the possible toxic effects which might be caused by it.

(2) Experiments on persons suffering from pain of various kinds, either in the form of essential neuralgia or as an epiphenomenon in other morbid conditions: these included,—

(*a*) Four cases of sciatica.

(*b*) One case of slight attacks of angina pectoris in a patient with atheroma of the aorta.

(*c*) One case of intestinal pain caused by malignant growth of the retroperitoneal glands.

(*d*) One case of neuralgia in a person suffering from polyneuritis.

(*e*) One case of brachial neuralgia in a neurotic subject.

(*f*) One case of gastric pain caused by epithelioma of the gall-bladder.

(*g*) One case of headache in a nervous person, the subject of multiple neuralgia simulating polyneuritis.

(*h*) One case of neuralgia of the bladder and stomach in a patient suffering from cancer of the liver and stomach.

(*i*) One case of muscular pains, probably of rheumatic origin, in a tuberculous subject.

(*k*) One case of pains in the arms symptomatic of spinal irritation.

As the results of these experiments, Lippi draws the following conclusions:

(1) Neurodin may be given in doses from a half to three grammes; these are effective and well borne, and may be repeated several times a day.

(2) These doses are perfectly harmless, and produce no other ill effect than occasional diarrhea, with or without intestinal pain.

(3) Hardly any physiological effects were noticed; in rare cases there was a slight diminution in the heart-beats; no marked effects on the kidneys were observed.

(4) As regards the analgesic action of the drug, it was found to have the property of soothing and even of abolishing pain, whether neuralgic in character or symptomatic of an organic affection; its action, however, is uncertain, and notably inferior to that of other similar remedies, such as phenacetin and antipyrin.

The remedy, moreover, has the great disadvantage of not being soluble in the vehicles in common use.

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INFLUENCE OF STARVATION UPON THE ACTION OF DRUGS.

JORDAN (*Centralblatt für deutsche medicinische Wissenschaft*, March 2, 1895, and *British Medical Journal*) remarks that as yet the great question of the modified action of drugs according to the various conditions of the organism has not been systematically investigated. Starvation is one of the most important of those conditions likely to modify the action of drugs. It is, moreover, of practical as well as theoretical importance to ascertain its influence, for starvation plays a prominent part in the clinical aspect of diseases, and some diseases produce the same pathological changes in the organism which starvation does. Delafoy found that starvation increased the action of strychnine in frogs. Lewin, from experiments on animals, considered that hunger caused the effect of intravenous injection of quinine, atropine, and nicotine to be diminished. This result in the case of atropine was confirmed by Roger. Jordan himself has made fifty experiments to ascertain what effect starvation has in modifying the action of digitalin. He took dogs for his experiments, and in each case injected the digitalin in the form of a watery solution (3 per mille) into the left vena cruralis. The dogs experimented on were allowed to drink water, but had no food, and the experiments were made on the third to the twelfth day of fasting. Control experiments were made on dogs chosen on account of their similarity for experimental purposes to the dogs used. He found that the minimal dose which appeared to have any effect was less in the starving dogs than in the others; that the minimum fatal dose is likewise less; and that by the same dose starving dogs are killed more rapidly than the control dogs. Fasting for only a short time alters but little the action of digitalin on the pulse frequency. When the fasting is prolonged, the diminished frequency of the heart's pulsation during the first and third periods of the action of digitalin, and during the second period the increase in frequency, are not so marked as in the control experiments. The blood-pressure rose very little during the first period, and the transition to the second period occurred gradually, and not suddenly as it did in the normally-fed dogs. In fasting dogs the vagus nerve is less easily stimulated; this phenomenon becomes more distinct the longer food is withheld, and, Jordan thinks, may account for the diminution in pulse frequency being so little marked during the first period of the action of digitalin in fasting dogs.

OBSTETRICS.

UNDER THE CHARGE OF

BARTON COOKE HIRST, M.D.,

ASSISTED BY

RICHARD C. NORRIS, M.D., AND FRANK W. TALLEY, M.D.

INCOERCIBLE VOMITING OF PREGNANCY TREATED BY ELECTRICITY.

GAUTIER (*Gazette des Hôpitaux*, March 12, 1895) recommends the application of the continuous current, placing the positive pole on the clavicle, between the two branches of the sterno-cleido-mastoid, and the negative pole over the umbilicus. A current of ten to fifteen milliampères should be used for from fifteen to thirty minutes. Gautier has successfully used this method in five cases in which the vomiting was so intense as to render provoked abortion almost imperative.

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Viburnum Prunifolium in Abortion.

Mme. Michailowa (*Meditzinskoje Obozrenije*, 1895) concludes from the trial in five cases that, contrary to the accepted opinion, this remedy not only does not always prevent abortion, but sometimes even occasions it, or, at least, accelerates a miscarriage already commenced. The hemostatic action of the drug (two grains, in powder four times daily) was constantly observed, but in two cases, after the first day, contraction of the uterus followed, favoring the commenced abortion. In three cases, directly after the administration of a dose, contraction of the external os was observed. The author believes that, although viburnum may occupy a prominent place in the treatment of female diseases, it is not without danger in threatened abortion.

Subcutaneous Emphysema in Labor.

A. Ulrik (*Ugeskrift for Läger*, 1895, p. 121) describes a case of subcutaneous emphysema in a healthy primipara, aged 28 years. The woman had been in labor with twins for ten hours, and one child had been already born. The pains recommenced, and the midwife advised the woman to make a strong effort to complete the delivery. Suddenly the face and neck of the woman became swollen, and the pains ceased completely. A surgeon was called, who delivered the second child with forceps. The face of the patient was then so swollen that the eyes could hardly be opened, the swelling reaching to the hair and downward over the neck to the breast and back, ending at the angle of the scapula. A marked crepitation was everywhere felt by the finger, thus rendering positive the diagnosis of subcutaneous emphysema. The voice was hoarse, and there were pain and difficulty in swallowing. Nothing abnormal, however, could be detected in the lungs. Ulrik explains the condition as probably a giving away of the lung-tissue in the vicinity of the hilus and the passage of the air from thence to the neck and head. The patient recovered completely in fourteen days.

Antiseptics in Midwifery.

The *Practitioner*, March, 1895, reviews the antiseptic methods employed in the following lying-in hospitals: Queen Charlotte's and the General Lying-in, in London; St. Mary's and Manchester and Salford Lying-in Institutions; Rotunda Hospital, Dublin; Maternity, Paris; Professor Winckel's Lying-in Hospital, Munich.

By observing the methods described, it will be observed that they admit of classification into (1) methods for disinfection of the hands and instruments; and (2) methods for the disinfection of the patient. The preliminary and most essential step is to thoroughly cleanse the hands with hot water, soap, and nail-brush, and then to immerse them for a minute in an antiseptic solution, repeating this immersion before each subsequent examination of the patient. Bichloride of mercury is the most widely used antiseptic agent. Some of this is lost by forming an insoluble oxide when mixed with ordinary water from the tap. Distilled water being not available in private practice, the following formula is recommended as insuring a stable solution:

℞	Pulv. hydrarg. bichlorid.	gr. x.
	Pulv. acid. tartaric.	gr. xx.
	Cochineal	gr. i.

M. et ft. pulv. One powder to a quart of water makes a solution 1 to 2000.

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The following routine procedure is suggested as not being unnecessarily complicated and easily carried out by the general practitioner if a competent nurse is in attendance. The patient should be directed to procure before term a packet of absorbent cotton, an ounce of sublimated vaseline (1 to 1000), and twelve powders prepared according to the above formula, or, if preferred, two quarts of carbolic acid solution (1 to 20). The nurse is directed to wash the vulva with soap and water as soon as the labor-pains begin, and then to thoroughly sponge it with cotton soaked in the antiseptic. A fresh supply of the antiseptic solution is then to be prepared and placed on a table by the side of the bed, together with the vaseline, in readiness for the physician's arrival.

Before making an examination, the hands are washed with soap and water and then immersed in the antiseptic solution. The vulva should be sponged from time to time with pledgets of cotton soaked in the antiseptic.

After labor is over, and during the puerperium, three basins should be placed side by side on the wash-stand and permanently kept there. The first is to be used for washing the hands; the second to contain the solution of bichloride of mercury, freshly prepared each morning; the third to contain a solution of the bichloride in which are kept the glass vaginal tube and catheter. If vaginal douches are not administered, the third basin will not be needed. The nurse is instructed to soak her hands in the solution contained in the second basin before doing anything for the patient which will involve contact with the genital organs.

If this plan is explained to the nurse and insisted upon, there is no reason why in most cases in private practice antiseptic precautions should not be carried out as efficiently as in the well-managed hospitals.

Rupture of the Uterus.

Magnus A. Tate (*Cincinnati Lancet-Clinic*, May 19, 1894) read before the Cincinnati Academy of Medicine, April 23, 1894, a paper upon rupture of the uterus, with thirty-one collected cases. The rupture may be very small, involving only part of the muscular wall, and occurring without the knowledge of the attending physician. It may extend down to the peritoneum through the entire muscular wall. It may extend through both the muscular wall and the peritoneum; or there may be numerous fissured lacerations of the external tissue proper of the uterus (which is a very rare and, indeed, doubtful variety) immediately beneath the peritoneum, which may give rise to subperitoneal hemorrhage.

From the number of ruptures reported by various authors, the average occurrence of rupture of the uterus is once in 2606 cases. It occurs more frequently in multiparæ than in primiparæ and in the middle-aged. Male children cause rupture more frequently than females. It is more liable to occur in long labors. The predisposing causes nearly always depend upon a diseased condition of the pelvis, uterus, or child. The exciting causes are, in the order of their frequency: *a*, ergot; *b*, forceps; *c*, version.

The seats of rupture are generally located as follows: During gestation, nearly always at the fundus or in its vicinity; during labor, at or about the neck; during labor, when injury is inflicted, at the injured part; and in cases of deformed pelvis, at or nearly opposite the deformity. The peritoneum is not always involved. The blood, not being able to flow into the abdominal cavity, forms an hematocele. A complete perforating rupture is most frequently situated at the posterior and next on the anterior wall of the cervix, partly because peritoneum

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descends farther, and partly because it is more intimately attached to those portions than at the sides of the cervix. The longitudinal tears generally predominate over the transverse, and are usually caused by shoulder presentations or when the head is of disproportionate size, while the circular rents occur for the most part in contracted pelves.

If the opening be a small one, and the head is driven down rapidly followed by the trunk, no part of the child need leave the uterine cavity, and delivery can then take place through the pelvis. A twin child has been known to have been born without any trouble, even after considerable rupture has occurred with the first child. The placenta, as a rule, gives very little trouble, and it may be expelled into the abdominal cavity or through the cervix into the vagina. The blood may pass *per vaginam*, but the largest collection generally flows into the abdominal cavity mixed with liquor amnii and meconium, so, if no surgical means are adopted, septic peritonitis may supervene.

Spontaneous rupture of a pregnant uterus is one of the rarest events. In exceptional cases labor follows so rapidly that the child can be born *per vias naturales*. Such a case occurred with Keppner. The placenta was followed by a mass of coils of intestine, which were replaced and held back by a tampon. Blind draws the following conclusions after a study of twenty-two cases during pregnancy:

(*a*) Rupture was constant in the fundus.

(*b*) Frequently there was found a marked thinning in the neighborhood of the tear.

(*c*) With relative frequency the point of rupture coincided with the placental attachment.

(*d*) The tubal cornea, when this gives attachment to placenta, are relatively disposed.

As a premonitory symptom, Byrne lays great stress upon a spasmodic pain which passes through the upper part of the sternum and back to the spine. In complete rupture there is severe pain constantly increasing until the time of rupture which announces itself by a loud tearing noise. The pain then ceases, there is tremor of the body, and patient goes into collapse. There is a marked change in the conformity of the abdomen. The fetal heart disappears and immediately the child is seen to struggle violently for a few minutes. Upon vaginal examination the previously presenting part may be felt receding and one or more coils of intestine noticed.

There is but one treatment for all cases of completely ruptured uterus,—*i.e.*, celiotomy. If the child has not passed into the abdominal cavity it is extracted by forceps, turning or craniotomy, when, the placenta being extracted, it is found that blood, amniotic liquor, and meconium have passed into the abdominal cavity. Should the child have escaped into the abdominal cavity it should not be brought with force through the tear, which enlarges the rent and produces shock. After opening the abdomen in the median line, the placenta and child are extracted and the whole abdominal cavity flushed with warm water. If the rent is on the anterior surface of the uterus it should be sutured, but if on the posterior surface, the author believes a Porro operation should be performed. In the thirty-one collected cases version was performed in four cases; forceps in one case; forceps failing, followed by version in two cases; gastrotomy in six cases; *per vias naturales* in five cases; craniotomy performed in two cases; Porro's operation in one case; blunt hook used in one case. One in seven recovered.

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REPAIR OF UTERINE INJURY IMMEDIATELY AFTER LABOR.

A. P. DUDLEY (*American Journal of Obstetrics*, February, 1895) expressed the opinion that the dangers attending manipulation of the genital tract after delivery, and the immediate repair of all injuries discoverable, are of less risk to the woman than the danger of post-partum hemorrhage and puerperal infection, and the danger to which she may be subjected in the future at its repair. He has performed immediate repair in twenty-one cases since 1889, and has observed no bad result from such manipulation. He almost invariably administers a small quantity of chloroform during the third stage of labor, and, as a consequence, while waiting for the placenta to be delivered, the patient sleeps. During this time he examines the perineum, urethra, and vestibule to see if any injury has occurred. As the placenta is delivered, the patient being in the Sims's position, he keeps her there, with the nurse making pressure on the fundus, until he can thoroughly wash and disinfect his hands, when he gently introduces one or two fingers into the vagina, and, knowing that in the majority of cases the uterus gives way bilaterally, he passes them to the right and left of the cervix, to discover if laceration has taken place. The relatives of the woman are informed that such laceration exists; some one of the family is called to continue the chloroform anesthesia; a large Sims's speculum is introduced and held by the nurse, even if the perineum be torn down to the sphincter. The operator then removes any shreds of membrane still clinging to the cervix, after thoroughly washing the vagina with a solution of bichloride of mercury (1 to 5000) and brings into apposition each lip of the cervix with a small pair of forceps. A pledget of sterilized gauze or cotton, saturated with a solution of bichloride of mercury is introduced into the cervix beyond the point of rupture, and as many sutures as necessary of No. 5 catgut are introduced by a curved, trocar-pointed needle with a large eye. None of the sutures are tied until all are introduced. The pledget is next removed, the cervix and vagina again cleansed with bichloride solution, and the sutures tied with enough traction to insure coaptation after the cervix contracts.

From his personal experience, Dudley concludes:

(1) That suturing the lacerated cervix properly, immediately after the labor, will result in primary union of the same and prevent many of the evils that follow in the wake of a union by second intention.

(2) That the fear of septicemia attending the manipulation of the cervix and the introduction of poisons which will induce septicemia at the same time is an unfounded one, and would be dissipated by giving such work a proper test.

(3) That it is a method of procedure more justifiable than an immediate repair of the perineum, which the profession of to-day universally advocates.

(4) That the securing of primary restoration of the laceration hastens involution, prevents subinvolution, and the various forms of displacement, which are induced by it in such an overweighted organ.

(5) That catgut is the proper suture and perfectly safe and reliable when carefully prepared.

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GYNECOLOGY.

UNDER THE CHARGE OF

CHARLES BINGHAM PENROSE, M.D.,

ASSISTED BY

WILLIAM A. CAREY, M.D., AND H. D. BEYEA, M.D.

The Best Method for the Sterilization of Catgut.

McLaren (*American Gynecological and Obstetrical Journal*, March, 1895), in a paper read before the Philadelphia Obstetrical Society, advised the following as the best method of sterilizing catgut: The catgut is wrapped in waxed paper, sealed in envelopes, and then placed for four hours in a dry, sterilizing oven at a temperature of 284° F. It is not removed from the sealed envelopes until needed for operation. If the best quality of catgut be selected, it will be found not to have been made too brittle by the heat. Boeckmann describes in the *Northwestern Lancet*, February, 1894, an apparatus for the dry sterilization of catgut.

The Preparation of Aseptic Catgut by means of Formalin.

Cunningham (*New York Medical Journal*, April, 1895), in a paper read before the Section in General Surgery of the New York Academy of Medicine, advises the following method of preparing aseptic catgut. The catgut is soaked for two days in a mixture of absolute alcohol and ether. It is then placed for several days in a mixture of equal parts of formalin, alcohol, and distilled water. After this treatment the formalin is removed from the gut by boiling it for a half hour in a normal saline solution. It is then preserved in alcohol and is ready for use. For this method the author claims the following advantages: The gut is absolutely sterile, as formalin is an active germicide; the sutures are less quickly absorbed, since formalin unites with albumens to form fairly insoluble compounds; the catgut is not brittle, and may be boiled in normal saline solution without losing its strength.

Extirpation of the Vagina.

The American Journal of the Medical Sciences, May, 1895, abstracts an article by Olshausen (*Centralblatt für Gynäkologie*, 1895, No. 1) in which his method of operating is described. The perineal body is divided transversely, and the vagina is separated from the rectum by blunt dissection as high as Douglas's pouch. If it is necessary to remove the uterus, the cul-de-sac is opened, the organ retroverted, and the broad ligaments tied off. The uterus, with the affected part of the vagina, is then removed with scissors. When the uterus is to be left, the peritoneal cavity is not opened, but the diseased portion of the vagina is separated from its attachments laterally, as well as posteriorly, and excised, the edge of the vaginal wound being attached in such a way as to establish a close connection between the lumen of that canal and the cavity in front of the rectum. If the vagina is narrow, more room is gained by splitting the posterior wall from the frenum as high as the diseased area.

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Laparotomy for Gauze Left in the Abdomen during the Original Operation.

Koch (*Centralblatt für Gynäkologie*) operated upon a woman for a left hydrosalpinx.

The operation was concluded without any incident of note, but after the lapse of two months it became necessary to perform a secondary operation for the relief of severe pains which constantly increased in severity. Upon opening the abdomen it was discovered that on the right side of the uterus there was an accumulation of pus, having the wall of the cavity formed by a layer of iodoform gauze which had been carefully packed in its position at the former operation. This was removed, the cavity carefully cleansed, and the patient recovered.

Two Interesting Cases of Dermoid Cyst of the Ovary,—Serious Complications.

Maurice H. Richardson (*Boston Medical and Surgical Journal*, April 25, 1895) reports two cases with most serious complications.

In the first case, a pyosalpinx had just been removed when a tumor, as large as an orange, came into view, wedged between the uterus and the rectum. This was found to be a dermoid cyst of the left ovary which grew into the rectal wall and projected into and through its mucous coat. The attached portion was about two inches long and the hair from the cyst projected into the lumen of the bowel. The tumor was removed by a clean dissection with scissors. The resulting opening in the rectal wall was deeply situated and involved the greater portion of the rectal wall. Patient was placed in Trendelenburg's position, and, by means of a long needle-holder, the several parts of the bowel were united with interrupted Lembert stitches. This was a most difficult piece of work, but the opening was closed satisfactorily.

In the second case the dermoid cyst filled the pelvic cavity and involved in its growth the sigmoid flexure. The cyst was gangrenous, and at least three inches of the intestinal wall had become involved in the necrotic process. The part of the bowel attached to the mesentery had not become affected. The tumor, which contained hair and fecal matter, was readily separated from the bowel, though complete resection was necessary. The gangrenous portion was removed until a clean, healthy surface was obtained and the edges were approximated and sutured by a single row of interrupted Lembert sutures of silk. In both cases great precautions were taken to guard against a possible escape of feces by the introduction of sterilized gauze for drainage. In each case there was an abundant discharge of fecal matter on the second and third days. Soon after this the drainage was discontinued and the patients speedily recovered, with no interference with nutrition or with peristalsis. The provision made for complete drainage was the life-saving feature of these two operations. No matter how carefully the intestinal wall may be sutured, and no matter what method is adopted in the sewing, there is a probability of a rupture in such cases as these, and the best means for preventing trouble lies in the use of gauze drainage.

Deciduo-Sarcoma of the Uterus.

The *British Medical Journal*, April, 1895, abstracts an article by Schauta (*Centralblatt für Gynäkologie*, No. 9, 1895) in which he describes a typical case of malignant degeneration of decidual relics. The patient was 29 years of age, and came

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under observation during her fifth pregnancy for frequent hemorrhages. During the seventh month of gestation the bleeding became quite free, and as it lingered over a fortnight the uterus was explored and a degenerated myxomatous ovum was detected. The uterus was cleared of its contents as carefully as possible by the fingers and packed with iodoform gauze. Hemorrhages occurred with free watery discharge after recovery. About six weeks later the uterus was again explored. Soft masses were found projecting into the cavity. The uterine body was soft and enlarged. There was also a tough dark-blue swelling on the posterior vaginal wall, the size of a nut; the mucosa which covered it was not adherent. There were two separate pelvic tumors. Microscopic examination of the scrapings proved the growth to be deciduo-sarcoma, and vaginal hysterectomy was performed with little difficulty and ultimate success. The ovaries were found to be considerably enlarged and were also removed. The vaginal deposit was excised. Not only the endometrium but also the vaginal deposit and the connective tissue of the ovaries contained new growths, resembling decidual tissue. This appears to be the first case in which the ovaries were infected. Three distinct forms of malignant degeneration of the decidua have recently been distinguished. In the first form, proliferation of the connective tissue of a decidual relic occurs (Gottschalk's sarcoma of the chorionic villi). The second has a proliferation of the epithelium of the villi (Klein's carcinoma of the villi). The third and commonest variety has the decidual cells and not the epithelium of the villi proliferating; hence, the new growth must be regarded as a sarcoma (sarcoma deciduo-cellulare, according to Schaut).

The Rapidity of Reproduction of the Uterine Mucosa in Women after Curettement.

Bossi (*Annali di Ostetrica e Gynecologia*, February, 1895, No. 2), after a series of observations and experiments made upon the uterine mucous membrane in women, with a comparative study of the same tissue in the dog to determine the rapidity of reproduction after curettement, formulates the following conclusions: (1) He found in two women upon whom it was necessary, twenty-five and twenty-seven days respectively, after curettement to do hysterectomy, a reproduction of the uterine mucous membrane histologically complete. (2) In a woman upon whom hysterectomy had to be performed fifteen days after curettement the uterine mucosa was found practically entirely reproduced, there being found, for some inappreciable cause, here and there tracts of deficient epithelial reproduction. (3) In seven cases under clinical observation, it was noted that the mucous membrane of the uterus was capable of permitting the development of a fecundated ovum in the limits of a minimum of twenty-five days to a maximum of twenty-nine days after the curettage. After that number of days, in each of the seven patients, fecundation took place, followed by pregnancy and birth at term, with an uneventful puerperium. *Bossi* states, however, notwithstanding this, that a complete sexual rest of at least sixty days should be prescribed after all curettements. For while the uterine mucous membrane is capable of fulfilling its physiological function of protecting and enveloping the fecundated ovum after the comparatively short time noted in his observations, yet there is always an element of danger in a pregnancy that follows a curettement of less than sixty days. There is in the reproduced uterine epithelium a condition of lessened resistance that leaves it more at the mercy of any intercurrent pathological condition or sudden traumatism.

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PATHOLOGY.

UNDER THE CHARGE OF

JOHN GUITÉRAS, M.D.,

ASSISTED BY

JOSEPH McFARLAND, M.D.

Upon the Biology of the Bacillus of Tetanus.

Righi (*La Rif. Med.*, 1894, No. 205) asserts that he has been able to secure the growth of the tetanus bacillus *aërobically*. The process by which this was accomplished was the transplantation of the highest part of old agar-agar puncture cultures. In the highest parts of these the bacilli were accustomed to a certain amount of diffused oxygen, and by the frequent transplantations readily allowed themselves to be introduced gradually to the free atmosphere. By this means Righi secured aërobic growths upon agar-agar and upon gelatin.

Indol Reaction in Bouillon Cultures of the Diphtheria Bacillus.

Palmirski and Orlowski (*Centralblatt für Bakteriologie und Parasitenkunde*, March 23, 1895, Vol. xvii, No. 11). The occurrence of indol can be demonstrated by these observers in old bouillon cultures of diphtheria. In the first two or three weeks it is not present, but seems to begin its formation in the third week. The method of demonstration employed was that of Legal, with the addition of a small crystal of nitro-hydrocyanate of sodium and acetic acid enough to produce the bluish-green color which characterizes indol.

The Action of the Diphtheria Antitoxic Serum upon the Kidneys and Heart.

Van Kahlden (*Centralblatt für allgemeine Pathologie und für pathologische Anatomie*, February 23, 1895, Bd. vi, Nos. 3 and 4, p. 122) experimented upon a series of rabbits and guinea-pigs to determine whether the injection of the diphtheria antitoxic serum in large amounts produced any untoward effects upon the organs in question. The largest amounts used were sixteen cubic centimetres given to a rabbit weighing 1350 grammes, and twelve cubic centimetres to a guinea-pig. The kidneys were preserved in alcohol and Flemming's solution. The microscopic examination of all the specimens led Van Kahlden to conclude that no pathological changes were present, and that the serum was absolutely harmless upon the kidneys. When doses of such size produce no alterations one can readily conclude that the ordinary doses, given in proportion to the body-weight and relatively much smaller, are without effect upon these organs. Van Kahlden points out that the kidneys of men may behave differently from those of animals, but calls attention to the fact that this difference cannot be very great as the action of the diphtheria toxin is the same upon both. He examined several kidneys from cases treated with the antitoxin, but found nothing to suggest that they had been damaged by the treatment.

Inasmuch as cardiac paralysis had been several times mentioned as following the use of antitoxin, Van Kahlden carefully examined the hearts of the animals experimented upon without finding the slightest pathological change.

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An Apparatus for Securing Clear Agar-Agar without Filtration.

M. Bleisch (*Centralblatt für Bakteriologie und Parasitenkunde*, March 23, 1895, Bd. xvii, No. 11, p. 360). This apparatus is extremely simple and very ingenious, and by allowing the agar-agar to sediment secures the clear supernatent liquid without the laborious process of filtration.

The apparatus consists of a long round glass vessel of about two litres capacity. The lower end is closed by a rubber cork through which a glass tube, closely fitted but movable, extends upward towards the top. The lower end of the glass tube has a rubber tube and pinch-cock attached. The whole apparatus is supported in a wooden frame.

When ready for use the agar-agar which is best neutralized with sodium phosphate, as this reagent causes a much more rapid sedimentation than the ordinarily employed sodium hydrate and carbonate, and which has been sufficiently well boiled after neutralization, is poured in and allowed to stand in a warm apparatus at a temperature of 50° to 60° C. until sedimentation has occurred, and the upper portion of the fluid is clear. The inner glass tube, which during the process of sedimentation has extended above the surface of the agar-agar, is now gently slid down until it is a few centimetres below its level. When the pinch-cock is opened the clear fluid flows down the tube into a receiving vessel. As soon as the fluid descends to the level of the tube, it is withdrawn a little more, and more fluid removed. By gradually withdrawing in this manner, the fluid is not agitated so as to disturb the precipitate, a small quantity of which will, of course, remain to be thrown away.

The Diagnostic Value of Mallein.

Hutyra und Preisz (*Deutsche Zeitschrift für Tiermedicin und vergleichende Pathologie*, Bd. xx, Hefte 5, 6, p. 369; abstracted in the *Centralblatt für Bakteriologie und Parasitenkunde*, March 15, 1895, Vol. xvii, Nos. 9, 10, p. 340). The cases collected by these observers show that mallein gave good results as a diagnostic in the hands of German observers in 95.7 per cent. of the cases in which it was employed; in the hands of French observers in 99.3 per cent. of the cases, and in their hands recommended itself as an excellent and reliable means of diagnosticating glanders.

The experience of the writers showed that a febrile reaction of 1.5° C. or under was not a sure diagnostic reaction, but that a reaction beyond this was practically infallible. The maximum elevation of temperature was reached in eight to fourteen hours after the hypodermic injection of 0.3 to 0.5 cubic centimetres, diluted with 3.0 cubic centimetres of a 5-per-cent. carbolic solution, and disappeared entirely in twenty-four hours. Not infrequently a secondary elevation of temperature was observed after the beginning of the defervescence. The injections do not cause a febrile reaction in any other condition.

The method of preparation suggested by Preisz is as follows:

Potato cultures are inoculated and kept in moist chambers until the medium becomes black and dry. They are then collected in a large vessel and covered with equal parts of distilled water and glycerin containing 3 to 5 per cent. of chloride of mercury ($HgCl_2$). After ten to fourteen days' maceration in the incubator at 37.5° C., they are filtered through paper and the filtrate sterilized for an hour by steam. The resulting solution is dark-brown. The dose, as already stated, is 0.3 to 0.5 cubic centimetres, which is preferably diluted with 3.0 cubic centimetres of 0.5-per-cent. carbolic solution.

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BOOK NOTICES.

A MONOGRAPH ON DISEASES OF THE BREAST. Their Pathology and Treatment. With special reference to Cancer. By ROGER WILLIAMS, F.R.C.S. London: John Bale & Sons, 1894.

The author of this work has omitted the customary preface, and the reader is at once introduced to the subject by a chapter on ontogeny and phylogeny of the breast. The mammary gland is followed through the different stages of its development, and the variations and anomalies to which it is subject, by reason of which the student is better enabled to comprehend the numerous pathological changes that occur in its structure. No less than two hundred and eighty-five pages are devoted to mammary cancer, fourteen of which refer to the occurrence of the disease in the male breast. The frequency of the affection quite justifies this extended consideration. The subject is first considered from an historical stand-point, after which is given a review of the present controversy concerning the origin of cancers. The author holds that a study of the evidence so far put forward does not warrant the acceptance of the parasitic nature of cancer. According to the view held by Herbert Spencer, which is accepted by the author, every cell in the body has the power, under favorable conditions, of developing itself into the form of the parent organism. That the reproductive activity actually displayed by the cells normally falls far short of their potentiality is believed by the same writer to be due to the restraining and modifying influence exerted by the whole organism on their protoplasm. When, from any cause, this state of balanced equilibrium is lost in any cell or cells, there a neoplasm will arise. Williams, after a review of the evidence, does not believe that cancers are contagious.

Two varieties of the disease in the breast are recognized,—namely, the *tubular* and the *acinous*, the latter, according to the author, constitutes about 94 per cent. of all breast cancers. The term encephaloid is discarded. The interesting questions of lymph-gland dissemination and of general dissemination are discussed at considerable length. The author believes that the hereditability of cancer cannot be doubted. It is stated that this disease is on the increase, as is shown by figures compiled from the mortality statistics of England and Wales. The statement is made that cancer seems certain ere long, if unchecked, to become one of the commonest diseases of modern communities.

Of great interest, on account of its important practical application, is the remark that pathological doctrine points so emphatically to the probability of cancer being curable by sufficiently thorough operations, that no one, nowadays, doubts the propriety of such proceedings. The author recommends the removal of the entire breast with the pectoral fascia and a layer of the subjacent pectoral muscle, but he does not believe that the entire removal of one or both pectorals is at all necessary. Even when the pectoral muscle is infiltrated, it will usually be found that the sternal portion alone is involved, and it is

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sufficient to excise this without interfering with the clavicular portion. The loss of the sternal part of the muscle does not cause any appreciable deformity and very little loss of function. It is advised to remove the mass of glands in the axilla in every case, and the author prefers not to divide the bridge of tissues connecting the breast with the axillary glands but to remove the whole *en masse*. We are told that modern statistical investigations not only prove that radical cures after operation do occur, but that they are of much greater frequency than has hitherto been generally believed. They have increased *pari passu* with the thoroughness of operating. From tables, which are included, it is shown that the average duration of life of the cases operated upon was sixteen months more than those not submitted to operation. The application of caustics as a method of treating cancer justly fails to receive approval. The work concludes with a discussion of the other affections of the breast,—neoplasms and inflammation.

Through the painstaking labor of the author, what is known of this subject to-day has been carefully collected and presented to the profession, and the work cannot fail to be of value to all who are interested in this department of medicine. Its teachings are in conformity with the most advanced modern thought, and with respect to the practical portions, in particular,—the pathology and treatment,—we feel that we can give the book our hearty endorsement.

THE YEAR-BOOK OF TREATMENT FOR 1895. A critical review for Practitioners of Medicine and Surgery. Philadelphia: Lea Brothers & Co. 1895.

The present issue of the Year-Book of Treatment follows the same general plan adopted in previous editions. There are, however, a few changes in the *personnel* of the staff of contributors. The section on "Diseases of the Heart and Circulation" has been undertaken by Dr. Coupland, that of "General Surgery" by Mr. William Rose, and that of "Public Health and Hygiene" by Dr. Whiteledge. The abstracts are well translated, concise and carefully selected, and doubtless the present volume, like its predecessors, will be found to be an excellent summary of the year's work in therapeutics.

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UNIVERSITY
MEDICAL MAGAZINE.

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MUNICIPAL MORTALITY STATISTICS.

By John S. Billings, M.D.,

Professor of Hygiene, University of Pennsylvania.

Municipal mortality statistics have a very considerable scientific interest and value, independent of their utility as a foundation for municipal hygiene. They are, as a rule, more complete and accurate than the mortality statistics of rural and thinly-settled districts, or of States and nations taken as a whole, and furnish some of the best data which we possess for studying certain problems connected with sociology and political economy, as well as those relating to the causes of particular forms of disease.

By mortality statistics we mean the ratios of deaths occurring in any given group of population during one year, or for one year of life of that group, except in the case of very young infants, and we express these rates as being so much per 1000 or per 100,000 of population. $M = \frac{D}{P}$. To obtain the most useful and valuable results from the study of death-rates, these must be properly comparable with each other. The factors which influence death-rates may be conveniently divided into two classes,—general and local. The most important general factors are the proportions of the different ages, sexes, and races in the population in which the deaths occurred; the local factors include what are generally called sanitary conditions, the incidence of epidemics, etc., and before we can properly estimate the nature and force of these local influences by comparisons of data from different localities, or from the same locality at different times, it is necessary to eliminate, as far as possible, differences due solely to variations in the general factors,—to secure a common denominator, as it were. Take,

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for example, the factor of age. As will be seen by Table I, the death-rate of children under five years of age is from seven to nine times as great as that of persons from fifteen to forty-five years of age, while after forty-five the death-rate is again much higher. The death-rate in any community or group of persons depends therefore very much upon the proportion of young children and of old persons in the population of that community or group. This influence of age is especially marked in the death-rates of certain diseases, as diphtheria, which is especially a disease of children, or of apoplexy or heart-disease, which pertain chiefly to persons over forty-five.

In like manner the influence of race, while not so great as that of age, is very considerable, even on the general death-rate, as will be seen from the figures given for the white and colored in Table I, and for different races of whites in Table II. It is not my purpose at this time to discuss the results of such comparisons, and they are alluded to merely to indicate their probable importance and interest.

The difficulties in the way of obtaining the data for making such comparisons are great, and it is to some of these difficulties that attention is now called. To calculate a death-rate, we must know the number of deaths for a given period of time—say a year—and the average number of people for that year among whom these deaths occurred. If we wish to know the death-rate from consumption among whites from fifteen to forty-five years of age, we must know the number of deaths from this cause in this class, and the number of the class itself. It is much easier to obtain such information with regard to the number of deaths than it is with regard to the population, but if the classification is a minute one, it is usually impossible to obtain the data for either the deaths or for the population.

The form for the registration of a death used in our cities usually calls for information with regard to the age, sex, color, birthplace, and occupation of the deceased person, and for a statement of the date, place, and cause of the death, and whether the person was married, single, widowed, or divorced. In those cities which have the best form of registration, information is also asked as to the birthplace of the father and of the mother of the deceased person. This is specially important information for American cities at the present time, as it is the only way in which we can get a clue to the probable race, since the birthplace of the person does not afford such a clue, especially for persons under twenty-five years of age. Philadelphia, Baltimore, Chicago, St. Louis, New Orleans, Louisville, Allegheny, and many other of our principal cities (ten out of the twenty-eight over 100,000), do not require this item, and hence very little information as to the relations of race to different causes of death is to be obtained from the records of

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these cities. Even when the registration forms contain all the information we ask for, the results of their compilation are usually published in municipal reports in such a way as not to permit of their use in scientific discussions with regard to the different causes of death. Such published statistics, for example, will show the number of deaths due to each of certain causes of death in persons in each of certain age groups. They will also, perhaps, show the number of deaths from each cause in the white and colored, in the native and foreign born, in each month of the year, and the number of deaths of persons following each of a number of different occupations. They will not, however, show the number of deaths due to a certain disease, as, for example, consumption, in persons of Irish descent in each age group, nor will they show the number of deaths caused by consumption among carpenters, masons, shoemakers, etc., between the ages of twenty-five and forty-five. When, however, such data are urgently wanted, the materials for compiling them may be in existence in the registration office in the form of the original returns for registration of death, and it is thus possible, at considerable expense and trouble, to obtain the information classified in the way one desires for the purpose of a particular research.

This, however, is not true as regards the population, which is always a matter of much greater uncertainty than the deaths, when one comes to deal with special limited groups for the purpose of preparing death-rates. As a rule, the population in our cities is obtained only once in ten years, with the distinctions of sex, age, color, birthplace, birthplaces of parents, conjugal condition, occupation, etc.,—that is, by the United States Census. In a few of the States, there is an intermediate census calling for the same data, so that in the cities in these States there is really a count of the population every five years. Except for a period of time in which the date of the census occurs in the middle of it, the population of a given city, or part of a city or of a particular group of population in the city, can only be a matter of estimate derived from certain mathematical calculations, into the details of which it is not necessary here to enter. No police census, school census, or any other form of census undertaken by a city ever enumerates the population with the distinctions of age, sex, color, etc., which are necessary for the calculation of special death-rates; and even as regards the gross population, such municipal censuses are very rarely sufficiently accurate to be relied upon in the calculation of death-rates, while for many of the subdivisions of population which are desirable for the calculation of special death-rates, the cities of the United States cannot obtain even approximate data for calculation from the published results of the United States or of the State Censuses.

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The United States Census will give for each city of over 25,000 inhabitants the number of its population, with distinctions of age, sex, color, native and foreign born, and of parentage, but for only a few cities will the distinction of birthplace of mother be given.

When we attempt to use the mortality statistics of cities for the investigation of the effects of local influences upon death-rates, and especially upon death-rates due to certain special forms of disease, we meet with still greater difficulties. In the first place, it is desirable to study the death-rates of a city not only as a whole, but also for certain parts of the city which present peculiarities, the effects of which we desire to ascertain. If, for example, we desire to study the effects of density of population, or soil drainage, of poverty, or of sewerage upon death-rates, it is necessary to compare different parts of the same city from these points of view. As a rule, however, the subdivision of a city into wards or into police districts has no relation to the altitude, soil dampness, density or character of population, or to the character of the dwellings, of the several districts, and hence, the information derivable from ward death-rates, even if we could obtain them, is by no means definite and satisfactory as to the influence of the various circumstances upon mortality.

For scientific purposes, as well as for the purposes of practical hygiene, it is very desirable that the mortality statistics of a city should be compiled with reference to units of area, selected with regard to circumstances which may have an influence on the life of the inhabitants, and not solely for political considerations. In the Eleventh Census an attempt was made to do something in this direction, by establishing divisions in a few cities—namely, Boston, New York, Brooklyn, Philadelphia, Baltimore, and Washington—with reference to the points above referred to. For example, in New York, which is divided into twenty-four wards, 114 sanitary districts, as they were called, were thus created. The records of deaths in the city were copied for each individual, each death being credited to the sanitary district in which it occurred, as far as possible. Many of the deaths which occurred in hospitals, asylums, and other institutions could not properly be credited to the district in which such institutions were located, and, as far as possible, information was obtained as to the district from which the person dying in an institution had been sent to that place, and the death was then credited to that district, as being the locality in which the original disease or injury had occurred. The census data with regard to population were then compiled for each of these districts, with distinctions of age, sex, birthplaces of mothers, etc., and thus were obtained the factors necessary to calculate death-rates for each sanitary district. The results are in many respects

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of great value, both locally and from a scientific point of view, but, as stated above, it is not my purpose to discuss them here. Those who are interested in them will find them in the reports published by the census office.

I wish next to call attention to a special difficulty which presents itself when we attempt to use death-rates derived from the comparatively small number of people in a sanitary district for purposes of comparison and investigation into the influences which affect special causes of death. The smaller the factors used in calculating such ratios as death-rates, the greater, as is well known, is the amount of what is commonly called "probable error" in these ratios, by which is meant not so much the probable error as the possible error which may occur from the much greater influence which a comparatively small variation in a few of the individual data will have upon the results when the numbers concerned are small than when they are large. If we divide the population of a sanitary district into the various classes of sex, age, race, etc., which have been suggested as desirable, it may very well happen that in a district we shall find that there was one Frenchman between the age of 45 and 65 living in the district, as shown by the census, and that the death record shows that one Frenchman between the age of 45 and 65 died in that district during the preceding year, which would give, say, a mortality of 100 per cent. In the same district there may be two Hungarians of the same age group, and no deaths of Hungarians in that age group occurred during the year. This may be considered as an extreme instance, but it is one which has actually occurred several times, and it may readily be seen that we cannot properly draw the conclusion from such figures that the mortality of Frenchmen of this age in that district is 100 times greater than that of Hungarians of the same age. It has even occurred in the census figures that in a certain very small group of population, the number who died during the year was three or four times as great as the number left living at the end of the year, indicating a mortality of over 100 per cent. Special care must, therefore, be taken in studying statistics of this kind to take into consideration the magnitude of the figures forming the factors for each special death-rate, as well as the magnitude of the death-rate itself. It should be noted, however, that the probable or possible error connected with the magnitude of the number of years of life, which is used as the divisor to obtain the ratio which we call the death-rate, differs very considerably according to the manner in which those years of life have been reckoned. Fifty persons living for ten years, and 500 persons living for one year each give 500 years of life, but the average annual death-rate obtained for the first group, by dividing the number of

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deaths which occurred in it during ten years by 500, will be more nearly a correct one than the one obtained for the group of 500, by using it as a divisor for the number of deaths which occurred in it during one year. If we can obtain the average death-rates of even a small sanitary district for a period of twenty years, the possible error due to the smallness of the numbers will, to a great extent, disappear, and they will be much more reliable as a measure of the tendency to death in that district than will be the death-rates of the whole city, of which it is a part, if taken for a single year.

The difficulties which a statistical officer of a city meets in attempting to prepare special rates of the kind referred to for different parts of the city have heretofore been so great in cities of this country as to be practically insurmountable. If his death records were properly kept and well looked after, it may be possible for him to classify the deaths by such sanitary districts as he may select, and by such further subdivisions of sex, age, etc., as he may think it desirable to use, but by no possibility could he obtain corresponding data for the population of these districts. For some cities the published records of the Tenth Census gave the gross population by wards. The Eleventh Census, as has been said, gives the population of a few cities by sanitary districts, but the characteristics of sanitary districts in a growing city are apt to change, and hence the health officer may desire to establish other boundaries than those which have been used for the census. But even supposing that a municipal statistician is satisfied to make use of the local subdivisions into sanitary districts employed by the census, he has no means at present of calculating the amount of change which has taken place in the several groups of population of a sanitary district since June 1, 1890, if, for example, he wishes to make his calculations for the year 1894. The means ordinarily made use of to calculate the population of a district or of a city at a period two or three years distant from the last census is the well-known geometrical progression formula, based on the ratios of increase or decrease of the population of the district or of the city which has been found to occur within the given time, by a comparison of the results of the last two censuses of the place. In the case of these sanitary districts, however, such a ratio cannot be accurately computed, because at present the results of but one census are available, and we can only apply the general ratio which may be computed for the whole city to one of its sanitary districts, and errors may thus be introduced, because while the population of the city may, as a whole, be increasing considerably, the population in some districts in the business and crowded portion of the city may be actually decreasing, while a much greater than the average rate of increase is taking place in some of the more thinly-settled districts at the periphery, owing to increase in means of rapid transportation.

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The only means, therefore, of obtaining accurate data with regard to the population of such sanitary districts for intermediate periods would be for the city to undertake to make a special census of them, or of some of them, for the use of the statistician or health officer of the place, but at present it is tolerably safe to say that there is no city in this country which would be willing to spend the money which would be necessary to accomplish this. It will, therefore, be necessary to wait until the next United States Census, in the hope that it will obtain the populations of these sanitary districts with the same classification and grouping as were used in the Eleventh Census, in order to afford data for the preparation of ratios for intermediate or for future years.

It is impossible to publish in full the data as to population or deaths which would be required for such a minute study of the mortality statistics of a large city as has been herein indicated as desirable. Let us suppose, for example, that a city is divided into twenty sanitary districts, and that in each of these districts the population is to be classified into twenty age groups of each of the two sexes of each of ten races. This would give a table showing 8000 places of figures, which would fill at least ten pages such as are contained in the quarto volumes of the census. If to this be added further subdivisions as to the conjugal condition and of the occupation of those 15 years of age and upwards, allowing four divisions for the conjugal condition and a classification of 100 occupations, we should have a further series which would occupy at least 400,000 places of figures. To tabulate the deaths in like manner, giving the particulars for each of 100 different causes of death in addition for each of the subdivisions, would require about 40,000,000 places of figures. Such subdivisions, or anything approaching them, are, of course, absolutely impossible, and would be useless. It is necessary to make a careful selection of those combinations of the different factors which seem most likely to have an influence upon the death-rates, and then as far as possible to induce the statisticians of the different cities to compile and publish their mortality statistics in conformity with such classification.

In order to avoid the fallacies due to the use of small numbers, the medical statistician desires, in studying the relations of a certain disease to conditions of sex, age, race, occupation, etc., to combine the data furnished by the records of a considerable number of cities; but in attempting to do this he meets with great difficulties, because some of these data are either not obtained or not published in such a way as to be comparable. In some cities data as to race are not obtainable, even from the original records; in others, the items of occupation, conjugal condition, etc., are not required on the forms for registering a death,

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and even if place is made for them on the form, no attention may be given by the person in charge of the registration to seeing that they are properly filled out. If we take the ten cities referred to on Table I and desire to obtain from their records the death-rates of those who may properly be termed Americans of the professional class from diseases of the nervous system, with distinctions of sex, age, and conjugal condition, in order to compare these with similar statistics of those of Irish or German descent, we shall find that in only two or three of the cities are the necessary details complete enough for this purpose.

The State of Pennsylvania has no general system of registration of deaths, being in this respect the most backward of all the older Northern States. It contains a large number of cities, very few of which have complete registration records, and many of which have none.

In Philadelphia, Allentown, Altoona, Carlisle, Erie, Harrisburg, McKeesport, Reading, Scranton, Williamsport, and York the birthplaces of parents are not called for on the registration form. In Allentown, Harrisburg, and Carlisle no record is made of the birthplace of the decedent. In Carlisle neither conjugal condition nor occupation is recorded. In Philadelphia, Pittsburg, Allentown, Altoona, Erie, McKeesport, Norristown, Reading, Scranton, Titusville, Williamsport, and York the record of conjugal condition is for married or single only, no note being made of divorced, most of whom are probably returned as single. On the certificates used in Bradford, Pennsylvania, in 1890, there is a place on the stub of the certificate, which is to be returned by the physician, for the item of color, but no record of color is made in the body of the certificate which he sends to the health office.

It would be easy to specify many divergencies of this kind, of greater or less importance, but I have said enough to indicate some of the difficulties which the statistician meets with at the present time in attempting to investigate mortality statistics in this country. It would require very little change in the form of certificate employed in our principal cities to enable it to furnish proper data, and thus afford the means of obtaining a uniform record of facts as a basis for scientific municipal mortality statistics.

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TABLE I.

Municipal Death-Rates in 1890.

	White.	Colored.	Under 5.	15-45.	45 and Over.
New York	28.5	37.5	96.8	13.5	47.2
Chicago	21.0	23.3	69.9	8.9	30.9
Philadelphia	22.3	32.4	76.0	10.4	37.4
Brooklyn	25.4	35.0	86.0	11.3	41.5
St. Louis	18.2	34.6	56.9	9.2	32.4
Boston	24.6	33.3	87.2	12.2	40.9
Baltimore	22.6	36.4	93.0	10.0	37.6
Cincinnati	21.9	33.0	76.4	10.3	36.6
New Orleans	25.4	36.6	75.4	15.2	47.7
Washington, D. C.	19.8	38.2	97.8	12.0	34.1
Sum of twenty-eight cities	22.8	33.6	78.0	10.7	

TABLE II.

Municipal Death-Rates in 1890—Whites.

	Of Children of Mothers Born in				
	United States.	Ireland.	Germany.	France.	Italy.
New York	29.0	32.2	22.0	24.1	40.0
Brooklyn	26.0	27.8	21.6	14.9	30.8
Boston	21.0	28.4	18.6	17.6	24.8
Cincinnati	20.7	19.8	17.9	8.6	15.8
Washington	16.0	25.5	19.8	16.3	14.1
Sum of eighteen cities	20.9	26.7	19.9	19.0	33.4

CONSUMPTION.

Death-Rates per 100,000 of Population of Corresponding Ages having Mothers born in the Specified Countries.

Color and Birthplaces of Mothers.	15 to 45 Years.	45 to 65 Years.	65 Years and Over (Ex. Unknown).
White	398.11	432.49	438.24
Colored	676.51	684.40	658.02
Birthplaces of mothers.			
United States (white)	228.49	240.26	252.26
England and Wales	256.80	350.73	302.41
Ireland	630.45	651.09	753.07
Scotland	363.66	361.01	402.34
France	276.96	444.02	633.80
Germany	340.75	420.99	452.32
Canada	490.34	350.11	462.53
Scandinavia	406.06	497.22	597.01
Hungary	193.85	777.20	
Bohemia	730.47	680.79	
Italy	261.60	385.08	420.17
Other foreign countries	259.87	451.49	581.21

These figures are for the sum of Boston, Brooklyn, Cincinnati, New York City, the District of Columbia, and the State of New Jersey.

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ON THE CARE OF THE EYE.[1]

By William F. Norris, M.D.,

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In most general hospitals grave surgical operations, severe fevers, or inflammations of vital organs rivet the attention of the student and of the nurse, and are apt to lead to comparative neglect of those cases in which the life of the patient is not usually or directly at stake. There is, however, no branch of nursing which requires more minute and unremitting attention than the nursing of eye operations and of diseased or wounded eyes. While it is, perhaps, less exciting than the nursing in surgical or gynecological wards, it is all important to the patient, inasmuch as skilful and conscientious attention will often save the eyesight and avert the calamity of absolute blindness. Let us consider, therefore, the essentials of nursing in eye wards, and first glance for a moment at some anatomical arrangements of the organ which we propose to care for.

The Conjunctival Sac.

The eyelids are lined and the eyeball covered by a mucous membrane known as the conjunctiva. When the margins of the lids are brought into contact the eye is said to be shut and the conjunctival sac is closed except, as regards the small openings under the upper lid which allow tears from the lachrymal gland to find their way into it, and two minute orifices near the inner angle of the eye, one in the upper and one in the lower lid, which form exits for the tears and lead them into the lachrymal sac whence they escape into the nose. The tears entering and flowing through the conjunctival sac constitute nature's method of keeping the sac washed out and free from noxious germs. In many cases of inflammation this washing of the conjunctiva is insufficient, and we are obliged to aid it by artificial means. Owing to the deep recess or fold of the conjunctival sac under the upper lid it is difficult to wash it clean, and even after thorough cleansing it is liable at every moment to be infected by germs coming in from the nose and lachrymal sac, so that complete and lasting asepsis is practically impossible; moreover, owing to the constant heat and moisture, any existing germs multiply almost as if in a brood oven. For this reason it is all the more incumbent upon us frequently to wash out the sac to prevent undue multiplication of harmful bacilli and the increase of the toxic material which they secrete, as well as to prevent any decompo-

[1] A lecture delivered to the nurses of the Training School of the Hospital of the University of Pennsylvania, March 25, 1895.

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sition of the secretions,—processes which are all favored by the protected situation of the conjunctival sac and its uniform and moderate temperature.

The conjunctival surface of the eyelids and of the eyeball is exquisitely sensitive, and any rough handling readily causes congestion of these tissues, while the slightest scratch of the epithelium covering them not only causes pain and a prompt flow of tears, but also gives an opportunity for infection of the tissues by their own secretions and the micro-organisms which they harbor. Remember, also, that in all deep ulcers as well as in all perforating wounds of the eye, whether due to accident or to operation, the slightest undue pressure may do serious injury, causing additional irritation of the eye or even rupturing a partially closed wound and perhaps producing hemorrhage into the anterior chamber, or causing protrusion of some of the contents of the eyeball through the gaping wound.

Let us consider some of the practical deductions from the foregoing statements and the best methods of carrying them out.

Cleanliness and Asepsis.

The most scrupulous cleanliness should be observed in regard to the patient's body and especially to the face and hands. A full bath should be given on admission and the face should be carefully washed with castile soap and water, followed by the application of bichloride of mercury in the strength of 1 : 5000. Special attention should be paid to the eyebrows and eyelashes, well-known lurking-places of dirt and of bacilli, and also to the finger-nails, as it is difficult always to keep the patient's hands away from his eyes. Of course, the nurse cannot be too careful about the cleanliness and frequent washing of her own hands to avoid aggravating the condition of the patient's eyes as well as to prevent her carrying contagious material to her own eyes or to those of other patients.

Cleansing of Bottles and of Dropping-Tubes.

All bottles and dropping-tubes should be chemically clean before using. This is best attained by boiling in water containing washing soda. The tubes of pipettes should be laid in a glass dish containing nitric acid, then transferred to a solution of soda, and finally rinsed clean with warm water. The rubber caps of the tubes should be thoroughly washed out with hot water and then laid for a time in alcohol, after which they should be taken out and dried. When not in use, pipettes should be in a clean receptacle and covered with absorbent sterilized cotton. In handling dropping-tubes, care should be taken to seize the tube some distance up the stem and to hold it upright, so

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that the contained fluid does not run back into the cap, carefully avoiding any contact of the fingers with the open end of the tube. The slightest touch at this point either with a septic finger or one which is charged with some other solution is sufficient to contaminate its contents.

Separate Bottles and Dropping-Tubes for each Patient.

Every patient should have his own bottles of eye-drops and his own pipettes, to avoid any possibility of carrying contagion from one patient to another. After his discharge, both bottles and pipettes should be thoroughly sterilized before being used for any one else.

Method of Applying Eye-Washes and Drops.

(1) All such solutions should be brought to a blood-heat before using. The aseptic and cleansing power of all collyria are thus increased. They are blander and more agreeable to the eye, and the patient finds it much easier to prevent straining and spasmodic closure of the lids. The heating of the various solutions is usually most readily effected by placing the bottles containing them in hot water until they have attained a proper temperature,—a fact which can be readily ascertained by letting a drop or two fall on the back of the hand.

(2) Having now the solution at a proper temperature, place the tips of one or two fingers on the skin of the lower lid just above the orbital margin and pull the lid gently away from the eyeball. We thus obtain a shallow groove between the eyeball and the conjunctival surface of the lid well adapted to hold a few drops of the solution which we desire to introduce into the conjunctival sac, and by holding the lid in this position for a few moments the fluid has an opportunity to thoroughly diffuse itself in the sac and to be absorbed by the cornea and conjunctiva.

(3) When we wish to cleanse the upper cul-de-sac, we should lay the pulp of the thumb or finger on the skin of the upper lid, just below the eyebrow, and raise the lid by gently pulling on it. At the same time the patient is directed to roll the eyeball downward. The finger should never press upon the eyeball, and even raising the upper lid without pressure on the eyeball should be avoided in all cases of deep ulceration of the cornea or of wound of the eyeball, as the straining and spasmodic closure of the lid which is apt to occur in nervous patients is likely to rupture the cornea at the bottom of the ulcer or to burst open the newly-closed wound, or perhaps even to force a fold of the iris or some other part of the structures of the interior of the eye into the wound.

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The Contagious Properties of Discharges from the Conjunctival Sac.

Never forget that the discharge from the conjunctiva in all cases of eye inflammations is to a greater or less degree capable of causing irritation and inflammation if conveyed to another eye. The discharges from eyes affected with gonorrheal ophthalmia, with purulent conjunctivitis, and with granular conjunctivitis are pre-eminently contagious, and too great care cannot be taken to prevent inoculating either your own eyes with it or those of other people.

Application of Heat.

In many cases of corneal ulcer and of inflammation of the iris, as well as after plastic operations where the flaps threaten to slough, the application of heat to stimulate the blood-vessels of surrounding parts and to give a better supply of nourishment to the diseased tissues is often advantageous. This may be efficiently carried out by putting either little masses of disinfected absorbent cotton or several thicknesses of aseptic gauze, cut into squares of suitable size, into hot water, applying them to the closed lids and changing them as fast as they become cool. Water may readily be kept hot continuously by placing the vessel which contains it in a water-bath over a spirit or gas flame. The temperature should range from about 100° to 125° F., according to the effect desired. When dry heat is desired, sponges or gauze compresses may be heated in a disinfecting oven, or dipped in hot water, wrung out dry, and used as heat-carriers. Great care should be taken not to exceed the temperatures mentioned, as otherwise we may scald or burn the delicate skin of the eyelids.

Application of Cold.

A block of ice should be placed on a sheet of gauze which has been tied securely over the top of a large tin or paper basin. Compresses of bichloride saturated gauze cut into pieces of suitable size should then be laid on the ice, and, when thoroughly cooled, transferred to the closed lids of the patient's eyes. These should be changed frequently, a cold one replacing that which has become partially warm from contact with the lids, the intervals being regulated by the amount of effect desired. By this arrangement both the compresses and the ice-block are kept disinfected by the fresh cold water from the gradual melting of the ice, while the compresses remain comparatively dry, and any discharge absorbed by them from the eye finds its way to the bottom of the basin. Of course, as the compresses become soiled fresh ones should be substituted. Cold thus efficiently applied is often

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invaluable in subduing inflammation after wounds and operations on the eye, while in the profuse discharge of purulent conjunctivitis it tends to contract the blood-vessels and to diminish the secretion.

Application of Leeches.

The application of leeches to the temple is often of great service in relieving pain and subduing inflammation in the eyes and their appendages. The leech is best applied by putting it in a large test-tube partly filled with water. When this is tilted so that its open end and the mouth of the animal come in contact with the skin of the temple, the leech feels so much at home in his native element that he promptly bites the skin when he touches it and sucks himself full of blood. Artificial leeches are small cylindrical cups applied over a cut in the skin, made either by dividing a fold of it with a bistoury or by cutting it with a revolving circular knife constructed for the purpose. In using the latter, care should be taken not to cut to an equal depth all round, otherwise the little wad of skin thus made is so far drawn above the level of the surrounding skin by the exhaustion of the cup as to cause an unnecessary difference of level and subsequent deformity. (Exhibition of Heurteloup's artificial leech.)

Care in the Use of Mydriatics and Myotics.

In addition to the use of detergent and more or less innocuous washes to the eye we are often obliged to use solutions of atropine, homatropine, hyoscine, etc., to dilate the pupil and to relax the ciliary muscle, as well as cocaine to render the outside of the eye for a time insensitive to pain. Excessive use of the latter is often harmful by causing the cornea partly to shed its epithelium, and all of them by running through the lachrymal passages into the nose and throat may produce their poisonous constitutional effects. Only the quantity ordered should therefore be dropped into the eyes, and at each application the three or four drops instilled should be held for a time in contact with the eyeball by pulling gently on the skin of the lower lid, as previously described and demonstrated. The same caution should be observed in the use of those poisons which contract the pupil,—viz., eserine and pilocarpine. Remember that every inflamed eye is not to be treated with atropine, and that some forms of iritis and all cases of glaucoma are made worse by the use of mydriatics. In case any of these solutions produce smarting when instilled, it is the duty of the nurse promptly to report it to the doctor, who should test the solution with litmus paper, and if it prove to be acid should cause it to be made neutral.

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The Eyelids and Eyelashes as Protectors, and the Removal of Foreign Bodies from the Conjunctiva.

Nature has provided for the protection of the eye mobile and sensitive eyelids with eyelashes, which on the upper lid curve upward and outward, and on the lower lid downward and outward. When the lids are almost closed the convex surface of the lashes come into contact and serve as a filter to keep dust and fine foreign bodies out of the eye. When they fail to do this, a little piece of dust, ashes, or cinder often lodges under the upper or lower lid and causes the eye to water and become painful. If under the upper lid this may readily be inverted by seizing the lashes between the thumb and forefinger of one hand, while with the point of the thumb of the other hand slight pressure is made at the upper edge of the tarsal cartilage. The patient is then told to look downward and the lashes which have been seized between the thumb and finger of the other hand are gently but quickly raised. Then the everted lid is softly wiped either with a gauze compress or with a little mop of absorbent cotton, and the foreign body will usually be entangled in its meshes and come away with it. When a minute foreign body has been driven into the cornea, a few drops of cocaine solution should be instilled and a doctor summoned to remove it.

Ventilation and Lighting of Wards.

Wards for eye patients should be kept free from dust and well ventilated, and supplied with such shades to the windows and screens round the beds that the light may be readily tempered, and that one portion of the ward may, if necessary, be kept darker than another. All sharp contrasts should be avoided, as nothing is more irritating to inflamed eyes than a streak of sunlight passing into a room where the light is otherwise tempered. As a general rule, a moderate amount of diffuse light should be admitted so that any one could readily and comfortably read in the ward, while the eyes of those needing greater protection from light are screened from it by the use of dark glasses, of frontal shades or of screens. When dark glasses are used, they should be carefully washed with alcohol at least twice daily by the nurse and wiped dry to prevent the condensation of the vapor given out by inflamed eyes becoming a source of further infection.

How to Hold a Baby and How to Fix its Head and Open its Eyes to Apply Washes and Drops.

The child having been wrapped in a sheet or towel to prevent useless struggles with the feet, its body should be placed in the nurse's lap while she holds its hands. The physician or nurse who

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is to examine the eyes or to apply the drops, sits immediately in front of the nurse who has the child in her lap and having protected the knees with a piece of rubber cloth, takes the child's head gently between the knees, thus fixing it and preventing any struggles which might bring the eye in contact with the dropping-tube. Then by placing the fingers on the skin of the upper and lower lids, and gently pulling the one upward and the other downward, the eyeball is readily exposed to view and the conjunctival sac held open to be washed out or to receive any drops. If the child cries and tries hard to shut the eyelids, this maneuvre will usually also evert the lids and expose their conjunctival surface to view. If it does not do so, and it is desirable to attain this end, the lid must be everted as already described in case of grown people.

Care of Cataract Operations.

Before every operation the patient should have a bath and be put to bed. Immediately previous to the operation the face should be washed with castile soap and water and then with 1 : 5000 bichloride, while the conjunctival sac should be washed out with a solution of the same, 1 : 8000. A few drops of a 2-per-cent. solution of cocaine are then instilled and the eye closed under an aseptic bandage. After the operation the light of the room should be tempered and the patient placed on his back in bed, the head being comfortably supported by pillows. During the first four days after the operation he should never be left a moment alone, but watched assiduously day and night, as any straining on his part or pressure on the eye by turning on either side, or by touching the eye with his own hand, may cause the wound to rupture and render nugatory, either partially or completely, the result of the operation. The patient should never be allowed to raise himself in bed or to blow his nose, and should be admonished to avoid, as far as possible, any coughing or sneezing. The supine position soon becomes very uncomfortable to most patients. They get restless, complain of backache, and desire to change their position. The nurse then should take both hands of the patient in one of hers and, slipping the other behind his neck, gently raise him to the sitting position, while an assistant slips a bed-rest behind him and adjusts the pillows to it. He is then allowed gently to sink back upon it. He may remain in this position till tired, and then, being held in the same way by the nurse while an assistant slips out the bed-rest, he is allowed gently once more to sink into the recumbent position. In the same way he should be raised to a sitting posture by the nurse while an assistant takes charge of the legs and brings them over the edge of the bed, if it becomes necessary to use the commode. Male patients

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should always be encouraged to use the urinal within the first four or five hours after operation. This will often prevent the retention of urine and the necessity of catheterization. Great care should be exercised to prevent the patient rubbing his eyes during sleep. If, in spite of these precautions, the patient remains restless or suffers pain, this should be promptly reported to the doctor that he may decide as to the use of bromides, sulphonal, or more active anodynes. The food for the first few days should be fluid and consist mainly of milk and soup, that all active movements of mastication may be avoided. It should never be forgotten that most cataract patients are old and need good nourishing diet and the moderate use of stimulants, to insure good nutrition of the body and prompt closing of the wound. Old people frequently become feeble from confinement to bed, and in such cases it is advisable to gently assist them to an arm-chair where they can sit wrapped in a blanket or other warm coverings at a time when, on account of the straining and exertion, it would be an unnecessary risk to put on the ordinary clothing and when more vigorous patients would still be confined to bed. During convalescence, all irritants to the eyes, such as dust, tobacco-smoke, and excess of light or strong wind, should be carefully avoided.

The Morale of Patients.

Most cataract patients are old, many are feeble, all for a time unable to use their eyes, while many are at a distance from their homes and usual surroundings. They are, therefore, cut off from all means of amusement or of distracting their thoughts; time hangs heavily on their hands and many become absolutely homesick. It is, therefore, necessary to talk to them, encourage them, read to them, and amuse them. Such influences not only help to pass their time but are of importance in aiding their appetite and improving their nutrition. In all cases where there is positive inflammation of one eye, either from disease or operation, the use of the fellow-eye for reading or any near work always causes congestion and pain in the inflamed one and often brings about a serious relapse. The same general principles should be carried out in nursing the convalescents from all severe fevers or acute and exhausting diseases. Especially in young people, after recovery from measles, scarlet fever, and typhoid fever, there is a tendency to congestion both of the exterior and interior of the eye, and a considerable use of it for reading, before they have entirely recovered their strength, may start changes in the eyes which not only cause discomfort and aggravate any low grade of existing inflammation, but also only too often cause slow distention of the eye and lead to myopia.

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In conclusion, let us remember that, while few of the diseases of the eye directly threaten the life of the patient, nevertheless, there are but few afflictions which make life more miserable or earning a livelihood more difficult than does impaired or destroyed eyesight. Let me hope that I have said enough to impress all who nurse eye-patients with the necessity of unrelaxing vigilance to prevent harm to the eyes, of the most scrupulous cleanliness in treating and of the greatest gentleness in handling them. By careful observance of the above simple rules you may often help to avert threatened blindness and to bring sunshine and happiness into many a valuable life.

THE MANAGEMENT OF SUMMER DIARRHEAS IN INFANTS.

By Herman B. Allyn, M.D.,

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The diarrheal diseases which prevail so largely in our cities in summer time are due principally to auto-intoxication, the poisons being developed by decomposition of the food-supply. About 90 per cent. of the children who die of these diseases are artificially fed, and, as is to be expected, most of them are fed with cow's milk. In Berlin, in a period of five years, there died 2567 sucklings fed at the breast or upon ass's milk; whereas the number of those fed upon cow's milk who died was 13,413.[1] In Philadelphia, in the ten years 1883–1893, the total mortality from "cholera infantum" was 10,514; 8666 were under 1 year of age, and 1467 from 1 to 2 years of age. Seibert gives the mortality from diarrheal diseases in New York City, from 1877 to 1887, in children under 5 years of age, as 31,048.

As the greatest mortality occurs during the hottest months,—June, July, and August,—evidently high temperature must be an important factor. In 1892, in Philadelphia, the mortality from diarrheal diseases in children under 5 years of age was 1380; of this number 1099 died during June, July, and August. In 1893, for the same period, the mortality was only 1065. In 1892 there were seventy-two days in June, July, and August when maximal temperatures of 80° F. and over were recorded by the signal service. The mean daily temperature reached 70° F. about June 4, and remained above 70° F. until August 27. From May 1, weekly maxima of 80° F. and over were reached in twenty-one weeks. There were eighty-three days in 1892, from June 1 to August 31, when the mean temperature was above 70° F.

[1] Adolf Baginsky, Berliner klinische Wochenschrift, 1894, No. 43, p. 972.

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Turning to 1893, we find that the temperature reached a mean of 70° F. June 13, fell below that from July 1 to 10, and then stayed above 70° F. until September 5. From May 1 weekly maxima of 80° F. and over occurred in nineteen weeks. There were seventy-three days from June 1 to August 31, when the temperature was 80° F. or over; but eighteen days when the mean temperature was under 70° F., or 10 days more than in 1892. The summer of 1892 was exceptionally hot, and this no doubt accounts for the mortality in that year being greater than in 1893, in spite of the larger population of the latter year.

But important as high temperature is, and not for a moment forgetting or ignoring its enervating influence, it cannot be in itself the most important factor. For breast-fed babies largely escape from fatal summer diarrhea, although they are exposed to the same temperatures, and the mortality in different parts of our cities varies considerably. After all the most important effect of summer heat is in favoring the fermentation of food, and especially of milk.

Baginsky[1] says that injury to the infantile organism through micro-organisms may arise in a threefold manner:

(1) Micro-organisms in themselves but little harmful may at a higher temperature so increase in numbers that they become injurious either *per se* or through the quantity of metabolic products arising from their increased growth. To this class belong, for example, the micro-organisms forming acids, as products of which lactic acid, formic acid, acetic acid, butyric acid, and others arise in the milk. They may act as intense intestinal irritants themselves, or through their known products; their activity can begin outside the infantile organism in the milk, and continue in the intestinal canal of the child.

(2) The micro-organisms which increase so very greatly at a higher temperature may be poisonous in themselves, or the products of their growth can be of a violently poisonous nature, so that even small quantities act injuriously. The poison can arise in the milk outside the infantile organism and be swallowed with the milk. It is of a chemical nature, no longer bound up with the life of microbes, but free and separated from the microbes.

(3) The infantile organism may from its surroundings—air, water, washing, clothing, etc.—receive microbes thriving at a higher temperature, which develop poisons in the infantile intestine from any, even germ-free, food, but especially if the food is not suitable, and if it leaves a residue which is not assimilable or assimilable with difficulty, and lingers long in the infant's intestine.

The summer diarrheas of children being the combined result of high temperature upon the food-supply and upon the organism of the

[1] Loc. cit.

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child, and the pernicious surroundings of many of our city children, it follows that special care should be exercised to have children in as good physical condition as possible before the advent of hot weather, and whenever it is possible to remove them from the city to more wholesome surroundings in the country, this should be done. Too frequently slight disturbances in intestinal digestion are considered of no importance, and upon the occurrence of hot weather parents are shocked to find the child apparently suddenly alarmingly, ill. But upon close questioning it will usually be found that the child's bowels and skin had not been in a thoroughly satisfactory condition; that the bowels were as a rule constipated, the movements too hard and pale, and more offensive than they should have been. Occasionally the passages may be too loose, with white curds in them. The complexion of the child is pallid, and possibly a little sallow. In spite of the fact that the child often sleeps well at night, and takes an active interest in its games and playthings, it does not look well, and *is not* well. I have come to look upon such a condition as one of danger. It is a slow toxemia, and under favoring conditions there may be a sudden acute explosion with the well-known phenomena of cholera infantum or enterocolitis. The child needs to have its bowels thoroughly emptied by means of castor oil or calomel, and to have its diet supervised and its surroundings made hygienic. I venture to repeat it, because it seems to me exceedingly important,—too many children are overlooked or neglected, even by physicians, until they are undeniably ill. If cared for earlier, much anxiety and not a few lives would be saved. The effort should be made during winter and spring to have the child free from digestive derangements and as robust as possible. To this end not only must the diet and digestion of the child be supervised, but its surroundings observed, and the amount of fresh air and sunshine which it gets, regulated. Too many of our children become house plants in winter, so that by spring they are weak and pale. A child that has no acute disease in a progressive stage is better for an outing every day that is not too stormy. Neither child nor adult can continue vigorous, let alone thrive, without it.

The surroundings of the patient include a great deal. They include the district or part of the city in which the patient lives, whether upon high or low ground, and the condition of the soil and drainage; the particular house in which the patient lives and the state of the drainage, and the amount of sunshine it gets; and, finally, the conditions of life of the family as regards cleanliness, wholesome food, and intelligent watchfulness of the almost numberless little things which contribute to infantile well-being.

To illustrate still further what I mean by surroundings, in 1892

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and 1893, in Philadelphia, one-third of the wards of the city produced respectively 57.04 and 48.31 per cent. of the total mortality from cholera infantum. While these wards are in general the most populous, other wards with as large or nearly as large population had a much lower mortality. I believe it could be shown that increased mortality in a given district is a product of bad sanitation, bad personal hygiene, and of ignorance as well as, if not more than, poverty. Morality is unquestionably also a large factor in this product. A very large population does not necessarily mean a very large death-rate, since London, with its 5,000,000 inhabitants, has a death-rate of only 17.9 per 1000, whereas that of Philadelphia is 22.6 per 1000.

In general, it may be said that the increasing tendency to build houses in rows has resulted in deficient sunshine and fresh air, and consequently lessened vigor for all the inmates. Of course, the little folks suffer most. Sometimes a child is kept so constantly in the living-room of the house, or in the sewing-room, where several are at work, that it breathes an impure air during a large part of the day. It must not be forgotten that the playthings of a child are a very important part of his surroundings. A much-loved doll, a stuffed pussy or dog is handled so frequently that it is liable to innumerable contaminations, and becomes a source of danger when the propensity of children to convey everything to the mouth is remembered. I have seen a severe attack of enterocolitis with intestinal ulceration develop in a baby, 9 months old, which was fed exclusively on peptonized and sterilized milk. The attack, moreover, occurred in midwinter. The baby had a marked tendency to put things into its mouth, and was especially fond of sucking the fringe of a much-used shawl.

The water supply also needs to be looked into. Ordinary Schuylkill water is unfit to drink, and is depressing to many children. Its harmfulness can be overcome by filtering and boiling, but even then it is not palatable.

For the practical purposes of this paper enterocolitis and cholera infantum may be considered the same. They may actually be the same, differing only in the dose of the poison or poisons and in the resistance of the child; or some special poison may in cholera infantum be superadded to those present in ordinary enterocolitis.

The attack begins in a variable manner. After a period of anemia and constipation the bowels become irritable; soon after taking food there is active peristalsis which the infant cannot control. The stools may be of a good color or slightly greenish, but in either case usually have a peculiar offensive odor. A little later there is occasional vomiting. In the intervals the child may be active and desire to go out and play, but he begins to look pale and hollow-eyed. Then, after a day

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of unusual languor and fretfulness, there occurs in the evening explosive vomiting, followed by coma and collapse. There is decided fever, a feeble and very frequent pulse, shallow respiration, a dusky pallor of the face with hollow eyes, pinched features, blue lips, and cold extremities. If the infant survive this stage, the bowels are moved frequently, the stools being at first somewhat fecal and watery, later more watery, just smearing the diaper and soaking into it like urine, and still later containing mucus and blood, and occasionally sloughs. The child has emerged from coma, but lies semiconscious with eyelids partly open. It swallows a few drops of fluid if they are put into the mouth, but resents being interfered with. Occasionally it emits a sharp cry caused by the pain of intestinal colic. Vomiting may occur from time to time. Gradually, in favorable cases, the fever lessens, the pulse gains power and becomes slower, the stools are fewer and less watery, the eyes appear less sunken, the expression improves, and the urine, which earlier may have been almost or quite suppressed, is secreted in moderate quantity. Convalescence is slow and liable to be interrupted by an aggravation of symptoms. The stools for a long time contain mucus, and are from this cause unduly offensive.

In other cases without a pronounced acute toxemia the child vomits and has greenish liquid stools which gradually increase in number. If the process remains unchecked, the stools later contain mucus and blood, vomiting becomes worse, so that scarcely anything can be retained, and the gradual wasting of the infant is as pitiful as it is progressive. In such cases there is apt to be intestinal ulceration.

In still other cases the attack is sudden and explosive in its violence, the watery purging and vomiting rapidly drain the tissues of fluids, and in a few hours the infant becomes so shrunken as to be almost unrecognizable. These are the acute toxemias generally known as cholera infantum.

As the food is the source of infection in most of the cases, the first thing to be done in the management of summer diarrheas in children is to inquire what food the child has been taking. It will generally be found that milk in some form is the basis of the food. A nursing infant will be fed from the bottle with milk none too fresh when first delivered, and before the milk has been swallowed by the infant it is spoiled. Often the nursling goes to sleep over a bottle without emptying it; when it wakes, the remains of the milk, which meantime has become sour, are swallowed. Or the milk itself may be wholesome and sweet, but the bottle and nipple not properly cleansed between the feedings. Contamination is especially liable to occur when a long tube is used to connect the nipple with the bottle.

Whatever the apparent connection between the milk and the ill-

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ness, my experience has led me in every case to withdraw the milk absolutely for a time. The infant is better without any nourishment for twenty-four or forty-eight hours. The next thing after withdrawing all food is to empty the stomach and bowels promptly. For this purpose nothing answers as well as the stomach-tube. When one is not at hand, a large-sized soft-rubber catheter attached through an intermediate glass tube and rubber drainage-tube to an ordinary small funnel answers every purpose.

The thing to be remembered in cases presenting marked toxemia is that prompt action is as important as in arsenical poisoning, as Vaughan aptly says. Immediate action, therefore, is better than even a short delay to secure apparatus. In one case I induced the infant to drink a quantity of warm water and then induced emesis by thrusting my forefinger down the baby's throat. In this case the infant lay comatose and collapsed all night, and only gradually roused during the succeeding forty-eight hours, but finally recovered after a tedious attack of enterocolitis. Evidently in this case only part of the poison was got rid of by emesis, and yet sufficient to save life.

The bowels are best emptied by a copious rectal injection of warm water given by the fountain syringe. This is not done simply to empty the bowel of fecal matter, nature may have done that sufficiently, but to get rid of any toxic matter which may still linger in the bowel in spite of nature's efforts at elimination. When the stomach and bowel have been evacuated mechanically, castor oil or calomel should be given to empty the small intestines, which, of course, have been unaffected by lavage and the enema. Castor oil is preferable to calomel, except when the stomach is irritable.

Following the exhibition of the laxative a spice-plaster or mustard-plaster, or similar stimulating application, should be made over the liver with a view of stimulating it to destroy toxines already in the portal circulation. If the infant is much prostrated or in collapse, ten drops of whiskey in hot water may be given every hour. If there should be high temperature with great restlessness, cold applications to the head may prove grateful, although they are not so well borne as in adults. A hot mustard foot-bath often quiets marked nervous irritability and allays fever by inducing perspiration. A hot general bath answers the same purpose, and is to be preferred if convulsions occur.

As already stated, the infant is better without any nourishment for twenty-four hours. Often parents are unwilling to obey the physician's directions in this particular. If there is reason to suspect such distrust, it is wiser to order a bland food than to subject the little patient to the risk of getting something unwholesome. Under such circum-

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stances, I am in the habit of ordering egg-water or rice-water. The former is made by stirring the white of an egg in a pint of water that has been boiled or filtered or both, and then cooled. This water can be seasoned with a little salt, and if there seem need for it in the condition of the baby, or if the infant be found to take it better, a teaspoonful or two of brandy may be added to it.

Rice-water is the water in which carefully washed rice has been boiled and then strained out through a cloth. Both rice-water and egg-water can be administered in a bottle in the usual way. The infant, as a rule, is not at first particular what it receives, so it is fluid and cool.

After an interval of abstinence for twenty-four hours, the infant will require some food, and the choice should fall upon one of several which are unlikely to ferment. The rice-water and egg-water are to be preferred for at least a few days, if the infant is in good flesh and the passages from the bowels are very frequent. I often add to this diet some beef-juice, made in the usual way,—that is, a juicy rump-steak is broiled quickly over a hot fire, so that the outside is browned, but the inside remains juicy; this is then minced and its juice squeezed out by a lemon-squeezer. A teaspoonful may be given every three or four hours, either alone or with the addition of ten drops of whiskey or brandy. An infant originally in good flesh can be nourished on this diet for a week or ten days, if the condition of the bowels seems to require it.

If the infant needs more nourishment, it is often well to give one of the farinaceous foods in water, with the addition of beef-juice.

Often the great feebleness of the infant makes it necessary to feed it a few drops at a time from a teaspoon or with a medicine-dropper. In all acute illnesses, especially of children, the parents need to be impressed with the fact that it not only does no good but may do actual harm to give the baby more food than it can retain and assimilate. The test of the proper amount of food to give must, therefore, be the retentive power of the stomach and the appearance of the feces. If the food is undigested, there will be evidence of it in the stools.

As soon as the toxemia passes away, in cases that do not immediately recover, the frequency of the stools is the most constant source of danger. At first they are fecal, then greenish and watery, and finally contain mucus, muco-pus, and blood, or are made up wholly of mucus and blood. Their number varies from twenty to forty in twenty-four hours. The frequency of the movements shows the existence of increased peristalsis. This must now be checked by opium. But the administration of opium or astringents before the stomach and bowels have been emptied mechanically and by purgative, or before so many

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movements have occurred that nature has accomplished the elimination of poisons which art should have done sooner, is dangerous, and may result in locking up poisons in the intestines and favoring fatal coma. Often there is a movement as soon as anything enters the stomach. The amount of opium given must depend upon the requirements of each case. It is preferable to give it separately from any mixture which may be ordered, lest at any time it may be desirable to lessen the opiate or stop it, but continue the rest of the mixture. Personally, I prefer the deodorized tincture of opium, and usually give it in quarter-drop doses every one, two, or three hours as seems to be best. For the nausea and the inflammatory condition of the bowels bismuth seems to give the best results. The salicylate seems to be better than the older subnitrate and subcarbonate. It needs to be given in large doses, as Dr. L. Emmet Holt insists. A very good combination is

℞ Bismuthi salicylat., CLX gr.;
Mist. cretæ, qs. ad f℥ii. M.
Sig.—Shake well. Teaspoonful every two hours.

To this may often be advantageously added a drop or two of spirit of camphor in each dose. Camphor is astringent and a stimulant, while it helps to allay the cutting pains in the belly so often present from the movement of gas in the inflamed bowels. Belladonna is also of service for this purpose.

The bismuth needs to be kept up continuously for days, until the stools become thicker and less frequent. By degrees these desirable changes usually occur, the blood soon disappears entirely, but the mucus is often present for a long time. One can tell before a napkin is opened whether it contains mucus or not by the peculiar, sickening odor.

If the infant is much emaciated, inunctions of olive oil are decidedly helpful, and at the same time they are usually grateful to the patient.

While the atmospheric condition to be chiefly dreaded during this tedious convalescence is still high temperature, yet one must be on his guard against a cool or cold wave coming up suddenly. Such sudden lowering of the temperature repeatedly has been the exciting cause of an attack of cholera morbus in adults, and of a fresh toxemia or an aggravation of the intestinal disorder in the patients we are considering. Possibly chilling of the surface leads to congestion of the viscera, notably of the liver, which is thereby hindered in its function of destroying poisons of intestinal origin. Whatever the mechanism, I am well satisfied of the fact. Infants, therefore, should be carefully guarded against such an untoward accident. For this purpose the

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infant's abdomen should be swathed in flannel. Inunctions of oil also help to prevent chilling of the surface. While the more air there is the better for the patient, draughts should be avoided, especially at night, and the infant should not be allowed to sleep uncovered. If necessary, a thin flannel night-robe can be made long enough to be fastened with a draw-string well below the limit of the feet. This will allow of free movement, but the feet cannot be uncovered.

To return to the food again. As soon as the patient's bowels begin to improve, a cautious return to milk should be attempted.

While cow's milk is the most frequent cause of the summer diarrheas of infants, it is, nevertheless, the best substitute for mother's milk. It is generally most acceptable when peptonized. In the first place, the peptonizing powder must be fresh; when fresh it is as white as wheat flour, but when stale it becomes yellow and lumpy. In the second place, the milk and cream must be fresh. This I find the hardest thing to obtain. With the majority of our poor families it is practically impossible. Unless the milk is fresh, it is folly to waste money in peptonizing it; the milk will be sour before the process is complete, especially if the longer processes are used. In the third place, the directions for peptonizing must be carried out with care, and the milk must then be placed in clean bottles, corked, and kept in a cool place.

There can be no question that when an infant is taking sufficient peptonized milk it is receiving ample nourishment; and in spite of the good results which have unquestionably followed the use of the different commercial foods, I always feel better satisfied when an infant which requires artificial food is taking peptonized cow's milk. As to sterilized milk, the results are not so uniformly good. The important point must not be forgotten, that sterilization alone lessens the digestibility and the nutritive value of milk; whereas peptonized milk is both partly digested and therefore more readily assimilated than plain milk, and by being heated to 160° F. or above, becomes sufficiently sterilized to be free from all dangerous bacteria. Of course, sterilization even does not destroy chemical poisons. Sterilized milk at this stage of convalescence therefore seems inadmissible.

Under the leadership of Dr. T. M. Rotch, of Boston, an effort is being made towards a scientific adaptation of cow's milk to the needs of nursing infants. A milk laboratory is established which gets its milk direct from a dairy, controlled absolutely by the laboratory. The milk and cream are separated in the laboratory and recombined in any proportion desired by the physician.

The cream separator gives a cream having a constant value of 16 per cent. fat, 4 per cent. sugar, and 3.6 per cent. proteids. The

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skimmed milk contains 0.13 per cent. fat, 4.40 per cent. sugar, and 4 per cent. proteids. A 20-per-cent. solution of milk-sugar is freshly prepared every day, and is used to modify the proportion of sugar in the cow's milk in accordance with the prescription of the physician. Thus, an average breast-milk containing 4 per cent. fat., 7 per cent. sugar, and 2 per cent. proteids, could be approximated as follows:

Fat, cream (16 per cent.)	f℥xii.
Sugar (20-per-cent. solution)	f℥xiiss.
Proteids, skimmed milk	f℥ix.
Distilled water	f℥xii.
Lime-water	f℥iiss.

For eight feedings of six ounces each.

Rotch has found that one-twentieth of lime-water by volume is sufficient to neutralize the acidity of ordinary cow's milk, and that three and three-eighths drachms of powdered milk-sugar to eight ounces of modified milk are required to give it the sweetness of breast-milk.

This scientific method of Rotch is a great step in advance, and when milk so prepared comes within the reach of those who need it most in our large cities the sale of patent foods will largely cease. I am satisfied from personal experience that the greatest fault with the milk supplied in Philadelphia is that it is stale when it reaches the consumer. I doubt if very many poor persons receive the milk within forty-eight hours of the time the cows are milked, and with the great majority the time is much longer. In all probability, if the milk could be supplied to the children within twelve or even twenty-four hours of milking time, there would be many fewer cases of summer diarrhea and a great saving in expense for artificial foods.

When the physician feels that the surroundings of his patient make it next to impossible either to get or to keep fresh cow's milk, it is far better to rely entirely on some artificial food or on condensed milk. While they are not as good as the best cow's milk, they are far safer for infants in summer time than milk which is not fresh to start with or which cannot be kept sweet and free from contamination, owing to carelessness or poverty of the parents.

Sometimes an infant, that was not very robust to begin with, emerges from the immediate danger of acute toxemia with an inflamed stomach and bowels which tax to the utmost the patience and resources of the physician. These cases are more frequent among the poorer classes, but are met with also in the infants of well-to-do people. Scarcely anything influences the prognosis so much as the means of the family. While among the poor the willingness to take infinite pains and attend strictly to minute details may not be less than in those in better cir-

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cumstances, their ability is necessarily less: they have not the means to provide a special nurse, nor can the mother, as a rule, devote herself exclusively to the sick infant, see that it is taken to a cool place during the day, and care for its innumerable wants promptly and skilfully. But not infrequently one encounters in these people a helpless fatalism. They will sit by the hour, mourning over the sick infant, endeavoring to still its heart-breaking cries, but cannot be stimulated into intelligent efforts for the child's recovery.

For several years I was out-door physician to the poor of one of our largest wards. During the summer I was called to see many infants with enterocolitis. While my position enabled me to furnish medicine and artificial foods free, there remained the struggle against the depressing surroundings of many of these patients, and the results were often disheartening. Sometimes it was possible to have the infant taken to a cool spot in Fairmount Park and kept there from morning to night. The benefit was often decided. The infant could sleep peacefully while in the park, and when awake would be less peevish, have fewer passages, and less vomiting. But after the return home to a hot, close house or room the infant might not be found much better by morning. In other cases the best that could be done was a ride on a steamboat upon the Schuylkill or Delaware, or even upon a street-car. During the coming summer, the trolley lines will be very helpful in giving to the poor a cheap ride and needed change of air. Unfortunately, the children's Country Week, and the Children's Sea-Shore House at Atlantic City cannot accommodate enough of the infants we are now concerned with to make them a very large factor in the relief of infantile mortality from enterocolitis. In some cases the over-busy mothers walk the streets at night as their only means of giving the infants cooler and better air.

The medicinal treatment of these cases is far from satisfactory. The bismuth mixture already mentioned may be continued if the bowels are loose. Sometimes it is not helpful. In such cases, dilute nitric acid with camphor-water and deodorized tincture of opium may be tried, or some of the vegetable astringents, as krameria. When the stomach is very irritable, nitrate of silver, in quarter-grain doses in aqueous solution, has often proved serviceable. One has constantly to be on his guard lest the remedies used to control the vomiting, diarrhea, and extreme restlessness and irritability of the patient should of themselves prove depressing. While I have not used trional in these cases, I should expect it to be of distinct value, because in other ailments I have noticed that it not only secured sleep to the patient, but also had a marked influence in controlling loose bowels, even causing decided constipation.

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In a few cases astringent injections of nitrate of silver have proved serviceable. When the movements are very frequent, injections of laudanum and starch-water may be used temporarily.

Among well-to-do persons such infants can be saved by securing a good wet-nurse, but among the very poor such a help cannot be had. The consequence is that among the poor there is a desperate struggle for a time to obtain some food which the infant can retain and assimilate. It will improve for a time and then relapse. By degrees, however, it usually loses flesh and strength slowly and often dies of inanition and exhaustion. These are the cases which begin in July or August and terminate in September. At the post-mortem examination one does not discover much beyond atrophy and minute hemorrhages and ulcerations in the gastric and intestinal mucous membrane.

The conclusions reached are as follows:

(1) The summer diarrheas of infants are primarily instances of poisoning, the poisons being developed in the food, especially milk, or introduced into the stomach and bowels in some other way.

(2) Apart from decomposition of food, the most important factors contributing to their fatality are high temperature, a bad sanitary condition of the district, uncleanliness of the house and of its occupants, and immorality of the parents or guardians.

(3) The occurrence of these cases should be foreseen in winter and early spring, and efforts made then to secure better living quarters and the highest degree possible of nutrition and health in the infants.

(4) The most desirable thing is a trustworthy source of fresh milk-supply. In the absence of the milk laboratories of Boston and New York, it is the personal duty of the physician to look carefully after the milk supplied to nursing infants. In young infants which have to be artificially fed I have had the best result with peptonized milk.

(5) No infants should pass the summer in the city if they can be removed to the country under fairly good surroundings. This should be done as a precaution before July and before they are ill. If summer diarrhea develops, removal to a cooler place where fresh milk can be had should be accomplished as soon as possible.

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THE INFLUENCE OF ETHER NARCOSIS UPON THE GENITO-URINARY TRACT.

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The physiological action of the usual anesthetics has been studied most carefully, and the greatest attention has been given to the action of these agents upon the respiratory and circulatory systems. This is, of course, of the utmost importance when one considers the immediate danger to the life of the patient during the anesthesia. There are, however, a number of cases in which the patient succumbs within two or three days after an operation, in which shock will not explain the fatal issue, nor will the gravity of the operation itself. The question, therefore, arises, what has been the cause of the unfavorable result? The fact that some patients develop, unexpectedly, unfavorable symptoms after operations of a trivial character, led us to give particular attention to the secretion from the kidneys and to the condition of the bladder.

The method we adopted to study this question was to examine carefully the urine of cases to be operated on for several days before the etherization. Except in two cases we did not include those demanding operation immediately after their admission to the hospital. Our investigations were confined to the effects of ether on the kidneys and bladder. With respect to chloroform, Israel has drawn attention to the possible dangers arising from that agent in consequence of its irritating effect on the kidney, and he relates a case where this was the only ascribable cause of death as proven post mortem. Israel was thereby induced to investigate the effects of chloroform on the kidneys in healthy individuals. He and his assistants examined the urine of 100 subjects,[1] having normal kidneys, before and after administering chloroform. He found in one-third of all cases deleterious effects on the kidneys lasting two or three days as proved by the appearance of traces of albumin, cylinders, leucocytes, kidney epithelium, and epithelium of the ureters and bladder.

In one case, having only one kidney, an operation had to be performed on the parietes of the abdomen; the urine showed for several days albumin and numerous cylinders, which again proved that chloroform does have a deleterious effect upon the kidney. Our investigations refer to a number of operative cases, in sixty-two of which the

[1] Deutsche medicinische Wochenschrift, 1893, S. 959.

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urine was found normal or without evidences of disease of the kidneys before the etherization. The urine was examined systematically for ten days after the etherization. Of these cases sixteen remained normal. In the remaining forty-seven abnormalities occurred. In eight cases irritation of the kidneys, ureters, and bladder were noted as shown by albumin, cylinders, renal, ureteral, and bladder epithelium. In fifteen cases signs of kidney irritation only were observed, and in twenty-four cases the bladder was affected. The irritation lasted for two or three days only in twenty-one cases, while in the remaining forty-two the urine had not returned to the normal condition at the termination of ten days after the etherization.

The effect of etherization on general tissue metamorphosis, apart from any effect upon the kidneys, is shown by the effect upon the specific gravity of the urine. In fifty cases it was markedly increased, while in thirteen only it was decreased. The following table will give a more detailed and accurate picture of the above stated facts:

L. B., AGED 24 YEARS.—EXCISION OF COCCYX.

Date.	Color.	Specific Gravity.	Reaction.	Albumin.	Sugar.	Remarks.
Feb. 3.	Yellow.	1015	Acid.	No.	No.	Operation.
" 4.	Reddish-yellow.	1033	"	Yes.	"	Hyaline casts, pus, and epithelial cells.
" 6.	Yellow.	1029	"	"	"	Hyaline casts, pus, and epithelial cells.
" 7.	"	. . . .	"	"	"	Hyaline casts, pus, and epithelial cells.
" 8.	"	1022	"	"	"	Hyaline casts, pus, and epithelial cells.
Feb. 9.	Yellowish-red.	. . . .	"	"	"	Hyaline casts, pus, and epithelial cells.
" 10.	Red.	1027	"	"	"	Hyaline casts, pus, and epithelial cells; oxide of lime.
" 11.	Reddish-yellow.	1035	"	"	"	Hyaline casts, pus, phosphate, and urates.
" 19.	Yellow.	1027	"	"	"	Hyaline casts; pus-cells (few).
Mar. 9.	"	1027	"	"	"	Hyaline casts; pus-cells (few).

T. B., AGED 25 YEARS.—RETROFLEXION OF UTERUS.

Jan. 27.	Yellow.	1025	Acid.	No.	No.	Operation.
" 30.	"	1024	"	"	"	
" 31.	"	1026	"	"	"	
Feb. 2.	Reddish-yellow.	1032	"	"	"	Some mucus; urates.

A. B., AGED 52 YEARS.—TUMOR OF BREAST.

April 29.	Yellow.	1030	Acid.	No.	No.	Operation.
" 30.	Red.	1031	"	Yes.	"	Pus.
May 1.	"	1020	"	Trace.	"	Pus; phosphates.
" 12.	Yellow.	1027	"	No.	"	

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M. C., AGED 28 YEARS.—APPENDICITIS.

Date.	Color.	Specific Gravity.	Reaction.	Albumin.	Sugar.	Remarks.
Feb. 6.	Yellow.	1038	Acid.	No.	No.	
" 7.	"	1028	"	"	"	Operation.
" 10.	"	1029	"	Trace.	"	Pus-cells; phosphates.
" 11.	"	1029	"	"	"	Pus-cells.
" 12.	"	1021	"	"	"	Pus-cells.
" 13.	"	1018	"	No.	"	
" 14.	"	1017	"	"	"	
" 15.	. . . .	1018	"	"	"	

A. D., AGED 27 YEARS.—AMPUTATION OF LEG.

. . . .	Yellow.	1020	Acid.	No.	No.	.
Mar. 24.	"	1017	"	"	"	
" 25.	"	1015	"	"	"	Phosphates.
" 26.	"	1012	"	"	"	Phosphates.
" 27.	"	1025	"	"	"	Phosphates.
April 13.	"	1015	"	"	"	Phosphates.
" 14.	"	1021	"	"	"	Phosphates.

J. E., AGED 35 YEARS.—CYST, PANCREAS.

Mar. 8.	Yellow.	1026	Alk.	No.	No.	Hyaline casts and pus.
" 17.	. . . .	. .	. . . .	. . . .	. . . .	Operation.
" 18.	Reddish-yellow.	1022	Acid.	Yes.	No.	Hyaline casts and pus.
" 20.	Red.	1026	"	"	No.	Hyaline casts and pus.

W. F., AGED 52 YEARS.—AMPUTATION OF THIGH.

April 26.	Yellow.	1016	Acid.	Trace.	No.	Operation.
" 27.	Reddish-yellow.	1030	"	Yes.	"	Numerous hyaline casts.
" 28.	Yellow.	1014	"	"	"	Numerous hyaline casts and pus.
" 29.	"	1016	"	"	"	Kidney epithelium and pus.
" 30.	"	1018	"	"	"	Kidney epithelium; much pus.

MRS. F., AGED 24 YEARS.—DERMOID CYST.

Feb. 5.	Yellow.	1010	Acid.	No.	No.	
" 6.	"	1024	"	"	"	Operation.
" 7.	Reddish-yellow.	1030	"	"	"	Phosphates and mucus.
" 8.	Yellow.	1030	"	Trace.	"	Urates and mucus; few pus-cells.
" 9.	"	1035	"	No.	"	Phosphates and mucus.
" 10.	"	1030	"	"	"	Phosphates.
" 11.	"	1030	"	"	"	Phosphates.
" 12.	"	1030	"	Trace.	"	Pus and bladder epithelium; urates.

MRS. G., AGED 34 YEARS.—EXTRA-UTERINE PREGNANCY.

Feb. 13.	Reddish yellow.	1018	Acid.	No.	No.	Pus and bladder epithelium.
" 14.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 15.	Yellow.	1018	"	No.	No.	Pus and bladder epithelium; uric acid, large quantity.
" 16.	"	1022	"	"	"	Pus and bladder epithelium.

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M. G., AGED 20 YEARS.—APPENDICITIS.

Date.	Color.	Specific Gravity.	Reaction.	Albumin.	Sugar.	Remarks.
Mar. 9.	Yellow.	1022	Acid.	No.	No.	
" 10.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 11.	Yellow.	1030	Acid.	No.	No.	
" 12.	"	1025	"	"	"	Pus and bladder epithelium.
" 15.	"	1025	"	"	"	Pus and bladder epithelium.

S. G., AGED 50 YEARS.—STRANGULATED HERNIA.

Mar. 5.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 6.	Yellow.	1027	Acid.	Yes.	No.	No examination before as he was operated on immediately. Hyaline and granular cast. This condition kept up for ten days, and when discharged urine still abnormal.

MRS. H., AGED 42 YEARS.—APPENDICITIS.

Jan. 1.	Yellow.	1026	Acid.	No.	No.	Urates.
" 2.	"	1032	"	"	"	Pus-cells.
" 3.	"	1034	"	Trace.	"	Red blood-corpuscles.
" 11.	Red.	1019	"	Yes.	. . . .	Red blood-corpuscles. Pus. Kidney and bladder epithelium.

J. H., AGED 19 YEARS.—AMPUTATION OF FOOT FOR TUBERCULAR DISEASE.

Feb. 22.	Reddish-yellow.	1025	Acid.	Trace.	No.	Hyaline cast; pus. This condition continued as long as examined.

W. H., AGED 57 YEARS.—FISTULA IN ANO.

Feb. 21.	Yellow.	1026	Acid.	No.	No.	
" 22.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 23.	Reddish-yellow.	1030	Acid.	No.	No.	
" 24.	. . . .	1034	. . . .	Trace.	. . . .	Pus.
" 25.	. . . .	1030	. . . .	No.	. . . .	Remains normal after that.

C. H., AGED 27 YEARS.—OPERATION FOR FRACTURED PATELLA (HOOKS).

Mar. 10.	Reddish-yellow.	1026	Acid.	Yes.	No.	Pus. Operation.
" 11.	Reddish-yellow.	1027	"	"	"	Pus and red blood-cells.
" 12.	Reddish-yellow.	1026	"	"	"	Pus and blood epithelium; red blood-corpuscles. Continues in this condition for ten days.

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H. T., AGED 23 YEARS.—APPENDICITIS.

Date.	Color.	Specific Gravity.	Reaction.	Albumin.	Sugar.	Remarks.
Feb. 20.	Yellow.	1027	. . . .	No.	No.	
" 21.	"	1032	. . . .	"	"	
" 22.	"	. . . .	. . . .	. . . .	. . . .	Operation.
" 23.	Reddish-yellow.	1032	Alk.	. . . .	No.	Pus; red corpuscles; kidney epithelium.
" 24.	Yellow.	1025	. . . .	Trace.	"	Pus-cells (few).
" 25.	"	1027	. . . .	No.	"	Phosphates. Remained normal afterwards.

J. K., AGED 32 YEARS.

Jan. 24.	Red.	1021	. . . .	Trace.	No.	
" 25.	"	. . . .	. . . .	. . . .	. . . .	Pus; red corpuscles; bladder epithelium.
" 26.						
" 27.	Reddish-yellow.	1024	. . . .	Yes.	No.	Etherization and urethroscopic examination made. Hyaline cast, pus, and epithelium. This continued for fifteen days.

H. L., AGED 70 YEARS.—CASTRATION.

Mar. 3.	Red.	1022	Acid.	No.	No.	
" 4.	. . . .	1028	"	"	"	
" 12.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 13.	Reddish-yellow.	1025	"	Yes.	"	Pus; red blood-corpuscles; kidney and bladder epithelium. Continued same up to death. Died from uremia.

McC. J., AGED 24 YEARS.—APPENDICITIS.

Jan. 30.	Yellow.	1031	Acid.	No.	No.	
Feb. 9.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 10.	" "	1035	Acid.	Yes.	"	Hyaline casts; red blood-corpuscles; urates.
" 11.	"	1024	"	Trace.	"	Pus; red blood-corpuscles.
" 12.		1020	"	"	"	Few pus-cells.
" 13.	"	1020	"	No.	"	Phosphates.
" 14.	"	1019	"	"	"	Phosphates.
" 15.	"	1020	"	. . . .	"	Pus-cells and bladder epithelium.

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M. McC., AGED 45 YEARS.—ABDOMINAL HYSTERECTOMY.

Date.	Color.	Specific Gravity.	Reaction.	Albumin.	Sugar.	Remarks.
Jan. 1.	Yellow.	1028	Acid.	No.	No.	
" 1.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 2.	Reddish-yellow.	1030	Acid.	Yes.	No.	Hyaline casts; mucus.
" 3.	Reddish-yellow.	1026	"	"	"	Hyaline casts; mucus.

J. H., AGED 46 YEARS.—HERNIA (RADICAL CURE).

Feb. 22.	Reddish-yellow.	1030	Acid.	Trace.	No.	Operation night of admission.
" 23.	Yellowish-red.	1034	"	"	"	Pus and epithelium.
" 24.	Reddish-yellow.	1027	"	"	"	Pus and mucus.
" 25.	Yellow.	1026	"	"	"	Pus and phosphates.
" 26.	"	1027	"	"	"	Pus.
" 27.	Red.	1027	"	"	"	Pus; red blood-corpuscles; renal and bladder epithelium.

R. M., AGED 20 YEARS.—AMPUTATION OF ARM.

April 4.	Yellow.	1023	Acid.	No.	No.	Normal after operation.

R. M., AGED 42 YEARS.—AMPUTATION OF TOE.

Feb. 17.	Reddish-yellow.	1020	Acid.	No.	No.	
" 21.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 22.	Yellow.	1023	Acid.	Yes.	No.	Pus; few red blood-corpuscles; bladder epithelium.
" 23.	"	1022	"	"	"	Pus; few red blood-corpuscles; bladder epithelium.
" 24.	"	1022	"	"	"	Pus; few red blood-corpuscles; bladder epithelium. Urine remained same for ten days.

A. N., AGED 27 YEARS.—HEMORRHOIDS.

April 27.	Yellow.	1030	Acid.	No.	No.	
" 29.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 30.	Yellow.	1030	Acid.	S. trace.	No.	Pus and bladder epithelium.
May 1.	"	1028	"	No.	"	Few pus-cells.
" 2.	"	1024	"	"	"	Remained normal.

C. N., AGED 30 YEARS.—AMPUTATION OF ARM.

Feb. 14.	Yellow.	1029	Acid.	No.	No.	Mucus. Operation day of admission.
" 15.	Reddish-yellow.	1024	"	"	"	

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C. N., AGED 30 YEARS.—AMPUTATION OF ARM—(*Continued*).

Date.	Color.	Specific Gravity.	Reaction.	Albumin.	Sugar.	Remarks.
Feb. 16.	Reddish-yellow.	1019	Acid.	No.	No.	Mucus.
" 17.	Yellow.	1031	"	"	"	
" 18.	"	1029	"	"	"	

J. O. R., AGED 19 YEARS.—AMPUTATION OF BOTH LEGS.

April 18.	Yellow.	. . . .	Acid.	No.	No.	
" 19.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 20.	Yellow.	1031	Acid.	Trace.	No.	Pus and hyaline casts.
" 21.	"	1027	"	S. trace.	"	Pus.
" 22.	"	1030	"	No.	"	Few pus-cells.
" 23.	"	1026	"	"	"	Remained normal.

M. P., AGED 45 YEARS.—AMPUTATION OF BREAST.

Feb. 25.	Yellow.	1020	Acid.	No.	No.	
" 26.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 27.	Yellow.	1025	Acid.	Trace.	No.	Hyaline casts; red blood-corpuscles; pus and epithelium.
" 28.	"	1032	"	"	"	Few casts; pus.
Mar. 1.	Red.	1027	"	"	"	Pus and epithelium.
" 2.	Yellow.	1016	"	No.	"	Few pus-cells.

M. P., AGED 50 YEARS.—LITHOLAPAXY.

Jan. 19.	Reddish-yellow.	1025	Acid.	Trace.	No.	Pus phosphate.
" 21.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 22.	Red.	1017	Acid.	Yes.	No.	Pus; red blood-corpuscles; phosphate.
" 23.	Reddish-yellow.	1014	"	"	"	Pus; kidney epithelium; red blood-corpuscles.
" 24.	Yellowish-red.	1015	"	"	"	Pus; kidney epithelium; red blood-corpuscles. Continued same for ten days.

J. R., AGED 36 YEARS.—AMPUTATION OF BREAST.

Mar. 21.	Yellow.	1016	Acid.	No.	No.	Red blood-corpuscles. Pus.
" 22.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 23.	Yellow.	. . . .	Acid.	Trace.	No.	Urates.
" 24.	"	1025	"	"	"	Urates.
" 25.	Reddish-yellow.	1021	"	"	"	Urates.
" 26.	Reddish-yellow.	1027	"	"	"	Pus and epithelium.
" 27.	Reddish-yellow.	1032	"	"	"	Pus and epithelium.
" 28.	Reddish-yellow.	1017	"	"	"	Pus and epithelium.
" 29.	Reddish-yellow.	1017	"	No.	"	

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M. R., AGED 24 YEARS.—LACERATED CERVIX.

Date.	Color.	Specific Gravity.	Reaction.	Albumin.	Sugar.	Remarks.
Feb. 13.	Yellow.	1024	Acid.	No.	No.	
" 15.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 16.	Yellow.	1025	Acid.	No.	No.	Remained normal.
" 17.	"	1027	"	"	"	
" 18.	"	1024	"	"	"	

N. R., AGED 27 YEARS.—PSOAS ABSCESS.

Feb. 6.	Yellow.	. . . .	Acid.	No.	No.	
" 7.	"	1030	"	"	"	Urates.
" 9.	"	. . . .	. . . .	. . . .	. . . .	Operation.
" 10.	"	1030	Acid.	No.	No.	Remained normal.
" 11.	"	1027	"	"	"	

J. R., AGED 49 YEARS.—LIPOMA OF BACK.

Jan. 29.	Yellow.	1029	Acid.	No.	No.	
" 20.	"	1035	"	"	"	Urates.
" 31.	. . .	. . . .	. . . .	. . . .	. . .	Operation.
Feb. 1.	Yellowish-red.	1030	Acid.	Trace.	No.	Few red blood-corpuscles; urates.
" 2.	Red.	1035	"	"	"	Pus and urates.
" 5.	Reddish-yellow.	1030	"	No.	"	
" 6.	Reddish-yellow.	1026	"	"	"	

L. B., AGED 18 YEARS.—APPENDICITIS.

April 10.	Yellow.	1003	Acid.	No.	No.	
" 11.	"	1026	"	"	"	
" 12.	"	. . . .	. . . .	. . . .	. . . .	Operation.
" 13.	"	1024	Acid.	No.	No.	Phosphates.
" 14.	"	1026	"	"	"	Phosphates.
" 15.	"	. . . .	"	Trace.	"	Pus-cells and few red blood-corpuscles.
" 16.	"	1027	"	No.	"	

M. R., AGED 20 YEARS.—APPENDICITIS.

Feb. 1.	Yellow.	1010	Acid.	No.	No.	
" 2.	"	1033	"	"	"	Operation.
" 3.	"	1020	"	"	"	
" 4.	Reddish-yellow.	1026	"	"	"	
" 5.	Reddish-yellow.	1020	"	"	"	
" 6.	Reddish-yellow.	1016	"	Trace.	"	Few red blood-corpuscles.
" 7.	Yellow.	1020	"	"	"	Few red blood-corpuscles.
" 8.	"	1020	"	No.	"	Few red blood-corpuscles.

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B. S., AGED 40 YEARS.—SARCOMA OF LIVER.

Date.	Color.	Specific Gravity.	Reaction.	Albumin.	Sugar.	Remarks.
Jan. 8.	Yellow.	1023	Alk.	No.	No.	
" 9.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 10.	Reddish-yellow.	1030	Acid.	Trace.	No.	Pus; red blood-corpuscle; bladder epithelium.
" 11.	Reddish-yellow.	1022	"	"	"	Pus; red blood-corpuscle.
" 13.	Reddish-yellow.	1019	"	"	"	Pus. Pus continued up to death, four weeks.

C. S., AGED 34 YEARS.—NECROSIS OF INFERIOR MAXILLA.

Feb. 20.	Reddish-yellow.	1028	Acid.	No.	No.	
" 21.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 22.	Yellow.	1027	Acid.	No.	No.	Remained normal.
" 23.	Reddish-yellow.	1027	"	"	"	
" 24.	Yellow.	1033	"	"	"	

V. S., AGED 32 YEARS.—FISTULA.

Mar. 26.	Yellow.	1019	Acid.	No.	No.	
" 27.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation. Remained normal.
" 28.	Yellow.	1017	Acid.	No.	No.	
" 29.	"	1014	"	"	"	

M. S., AGED 70 YEARS.—CARCINOMA.

April 11.	Yellow.	. . . .	Acid.	No.	No.	
" 30.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
May 1.	Yellow.	1019	Acid.	Yes.	No.	Pus; red corpuscle; epithelium.
" 2.	"	1017	"	"	"	Pus; few red blood-corpuscles; renal epithelium.
" 3.	"	1022	"	"	"	Pus; few red blood-corpuscles; renal epithelium. Died from exhaustion.

E. S., AGED 32 YEARS.—HEMORRHOIDS.

Feb. 21.	Yellow.	1027	Acid.	No.	No.	Few pus-cells.
" 22.	"	1025	"	Trace.	"	Few pus-cells.
Mar. 8.	"	1031	"	"	"	Few pus-cells.
" 9.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.

G. S., AGED 34 YEARS.—INCARCERATED HERNIA.

Mar. 8.	Yellow.	1020	Acid.	No.	No.	
" 9.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 10.	Reddish-yellow.	1028	Acid.	Yes.	No.	Hayaline casts; pus.
" 11.	Reddish-yellow.	1031	"	Trace.	"	Pus.

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G. S., AGED 34 YEARS.—INCARCERATED HERNIA.—(*Continued.*)

Date.	Color.	Specific Gravity.	Reaction.	Albumin.	Sugar.	Remarks.
Mar. 12.	Reddish-yellow.	1032	Acid.	No.	No.	
" 13.	Reddish-yellow.	1032	"	S. trace.	"	Few pus-cells.
" 14.	Reddish-yellow.	1031	"	No.	"	Died from delirium tremens.

D. S., AGED 32 YEARS.—NEPHROTOMY, PYO-NEPHRECTOMY.

Feb. 24.	Yellow.	1010	Alk.	Yes.	No.	Pus and kidney epithelium.
" 25.	"	1010	"	"	"	Pus and kidney epithelium.
" 26.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 27.	Reddish-yellow.	1012	Alk.	Yes.	No.	Renal epithelium; red blood-corpuscles; pus.
" 28.	Yellow.	1010	"	Trace.	"	Pus.
Mar. 1.	"	1016	"	"	"	Pus.
" 2.	"	1010	"	"	"	Pus.
" 3.	"	1008	"	"	"	Pus.
" 5.	"	1006	"	"	"	Pus and few kidney-cells.

M. V., AGED 38 YEARS.—AMPUTATION OF BREAST.

Mar. 21.	Yellow.	1025	Acid.	No.	No.	New pus-cells; bladder epithelium.
" 21.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 22.	Yellow.	1027	Acid.	Yes.	No.	Hyaline casts; pus; renal epithelium.
" 23.	Reddish-yellow.	1027	"	"	"	Few casts; pus; renal epithelium.
" 24.	Yellow.	1027	"	Trace.	"	Pus and epithelium.
" 25.	Reddish-yellow.	1026	"	No.	"	Few pus-cells.
" 26.	Reddish-yellow.	1027	"	"	"	
" 27.	Reddish-yellow.	1026	"	Trace.	"	Few pus and red blood-corpuscles.
" 28.	Yellow.	1021	"	No.	"	Few pus-cells.

I. W., AGED 42 YEARS.—DIVULSION OF URETHRAL STRICTURE.

May 2.	Reddish-yellow.	1020	Acid.	No.	No.	
" 2.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 3.	Red.	1020	Acid.	Yes.	No.	Few hyaline casts; kidney epithelium; pus.
" 4.	"	1027	"	"	"	Pus and red blood-corpuscles.
" 6.	Reddish-yellow.	1026	Alk.	"	"	Pus and red blood-corpuscles; phosphates.
" 7.	Reddish-yellow.	1024	"	Trace.	"	Pus. Left house.

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J. W. (FEMALE), AGED 28 YEARS.

Date.	Color.	Specific Gravity.	Reaction.	Albumin.	Sugar.	Remarks.
Jan. 14.	Yellow.	1027	Acid.	No.	No.	Pus and bladder epithelium; urates.
" 15.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 16.	Yellow.	1033	Acid.	Yes.	No.	Pus urates; hyaline casts.
" 17.	"	. . . .	"	"	"	Pus urates; hyaline casts.
" 18.	Reddish-yellow.	1018	"	"	"	Hyaline casts present. Conditions continued until disch'ged.

F. W., AGED 50 YEARS.—LITHOLAPAXY.

Feb. 14.	Yellow.	1027	Acid.	No.	No.	
" 21.	"	1036	"	"	"	
" 22.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 23.	Yellow.	1031	Acid.	Trace.	No.	Pus.
" 24.	Reddish-yellow.	1032	"	Yes.	"	Pus and mucus.
" 25.	Yellowish-red.	1032	Alk.	"	"	Pus and red blood-corpuscles.
" 26.	Yellowish-red.	1031	"	"	"	Pus and red blood-corpuscles.
" 27.	Reddish-yellow.	1026	"	"	"	Pus and red blood-corpuscles; phosphates.
" 28.	Reddish-yellow.	1023	"	"	"	Pus and red blood-corpuscles.

DR. W., AGED 70 YEARS.—LITHOLAPAXY.

April 29.	Yellow.	1024	Alk.	Yes.	No.	Large amount of pus.
May 1.	. . . .	. . . .	. . . .	. . . .	. . . .	Operation.
" 2.	Reddish-yellow.	. . . .	Acid.	"	No.	Hyaline casts, pus, red blood-corpuscles, and renal epithelium.
" 3.	Red.	1020	"	"	"	Hyaline casts and red blood-corpuscles.
" 4.	"	1019	"	"	"	This condition continued.

M. C., AGED 25 YEARS.—OVARIOTOMY.

May 4.	Yellow.	1025	Acid.	No.	No.	
" 6.	Reddish-yellow.	1036	"	Trace.	"	Hyaline casts; pus; bladder epithelium; urates.
" 7.	Reddish-yellow.	1031	"	"	"	Few cells; kidney epithelium.
" 8.	Reddish-yellow.	1027	"	"	"	Pus; kidney and bladder epithelium.
" 9.	Yellow.	1026	"	"	"	Pus and bladder epithelium.
" 10.	"	1024	"	No.	"	

C. D., AGED 30 YEARS.

. . . .	Yellow.	1031	Acid.	No.	No.	
April 10.	"	1015	"	"	"	
" 11.	"	1024	"	"	"	Phosphates.

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J. D., AGED 72 YEARS.—PERINEAL SECTION.

Date.	Color.	Specific Gravity.	Reaction.	Albumin.	Sugar.	Remarks.
Mar. 1.	Yellow.	1017	Alk.	Trace.	No.	Pus; red blood-corpuscles; pus and bladder epithelium.
" 2.	"	1017	"	"	"	Pus; red blood-corpuscles; pus and bladder epithelium:
" 4.	Reddish-yellow.	1017	"	"	"	Hyaline casts; epithelium; red blood-corpuscles. Took ether badly. Chloroform used. Stopped breathing. Artificial respiration performed.
" 5.	"	1015	"	"	"	Hyaline casts; pus and red blood-corpuscles.
" 7.	Yellow.	1016	Acid.	"	"	Hyaline casts; pus.
" 8.	"	1017	"	"	"	Hyaline casts; pus.
" 10.	"	1016	"	"	"	Hyaline casts; pus.

J. B., AGED 32 YEARS.—APPENDICITIS.

Jan. 9.	Light yellow.	1019	Acid.	No.	No.	
" 10.	Yellow.	1029	"	"	"	
" 11.	"	1024	"	"	"	
" 12.	"	1026	"	"	"	
" 18.	"	1022	"	"	"	

H. B., AGED 60 YEARS.—LITHOLAPAXY.

Jan. 20.	Yellow.	1027	Acid.	Trace.	No.	Pus; phosphates; mucus.
" 21.	Reddish-yellow.	1029	"	Yes.	"	Pus; red blood-corpuscles; phosphate.
" 24.	Red.	1027	"	"	"	Pus; red blood-corpuscles; bladder epithelium.
" 25.	"	1024	Alk.	"	"	Pus; red blood-corpuscles; bladder epithelium; phosphate.
" 26.	"	1021	"	"	"	Pus; red blood-corpuscles; bladder epithelium; phosphate.
" 27.	"	1022	"	"	"	Pus; red blood-corpuscles; bladder epithelium; phosphate.
" 28.	Yellowish-red.	1024	"	"	"	Pus; red blood-corpuscles; bladder epithelium; phosphate.
" 29.	Reddish-yellow.	1024	Acid.	"	"	Pus; red blood-corpuscles; bladder epithelium; phosphate.
" 30.	Yellowish-red.	1028	"	"	"	Pus; red blood-corpuscles; phosphate.

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B. A., AGED 35 YEARS.—TUMOR OF NECK.

Date.	Color.	Specific Gravity.	Reaction.	Albumin.	Sugar.	Remarks.
Jan. 18.	Reddish-yellow.	1027	Acid.	No.	No.	Considerable mucus.
" 20.	Reddish-yellow.	1029	"	"	"	Mucus and phosphates.
" 21.	Reddish-yellow.	1029	"	"	"	Mucus.
" 22.	Reddish-yellow.	1030	"	"	"	Phosphates few.
" 23.	Reddish-yellow.	1026	"	"	"	Phosphates few.
" 24.	Reddish-yellow.	1028	"	"	"	Phosphates few.

M. A., AGED 28 YEARS.—TUMOR OF BREAST.

April 17.	Yellow.	1012	Acid.	No.	No.	
" 19.	"	1028	"	"	"	
" 20.	"	1022	"	"	"	
" 21.	"	1025	"	"	"	

MRS. A., AGED 60 YEARS.—TUMOR OF BREAST.

Feb. 17.	Yellow.	1032	Acid.	No.	No.	Phosphates and mucus.
" 19.	"	. . . .	"	"	"	Hyaline casts; pus; bladder and renal epithelium.
" 20.	"	. . . .	"	"	"	Hyaline casts; pus. Died Feb. 21 from uremia. Large woman, 60 years. Took ether badly. Stopped breathing.

MRS. B., AGED 58 YEARS.—STRANGULATED HERNIA.

. . . .	Yellow.	1018	Acid.	Yes.	No.	
Feb. 5.	Reddish-yellow.	1025	"	Yes.	"	Much pus.
" 6.	Yellow.	1022	"	Trace.	"	Pus and bladder epithelium.
" 7.	"	1025	"	No.	"	Mucus.
" 8.	"	1026	"	"	"	Mucus.
" 9.	"	1027	"	"	"	Mucus.
" 10.	"	1024	"	"	"	Mucus.
" 11.	"	1026	"	"	"	

A. B., AGED 45 YEARS.—FACIAL.

Feb. 10.	Yellow.	1025	Acid.	No.	No.	Phosphate and mucus.
" 12.	"	1032	"	"	"	
" 13.	"	1026	"	"	"	
" 14.	"	. . . .	"	"	"	

Mrs. H., aged 37 years. February 3, ventral fixation. Urine remained normal.

Mrs. H., aged 46 years. January 5, ventral fixation. Developed Bright's disease several months after operation. No immediate changes.

Mrs. J., aged 46 years. February 26, amputation of breast. Normal before and after etherization.

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Mrs. J. F., aged 25 years. Dilatation and curetting. Had pus for one day after operation, then normal.

Mrs. K., aged 21 years. Amputation of breast. Normal before and after.

J. J., aged 21 years. Cervical adenitis. Normal before and after.

Consideration of these results leads us to the conclusion that ether has a very considerable irritating effect on the kidneys. The necessity of examining the urine of every patient to be anesthetized is again emphasized by these facts.

Great caution must always be exercised by the etherizer, as etherization is a most important part in any operation. The quantity of the ether used ought to be as little as consistent with the necessary anesthetic effect. The irritating effect of ether on the urinary tract is necessarily more profound the more of the drug is inhaled, and evil results may ensue, notwithstanding that the heart and respiration are not affected. Careless and reckless administration of ether may spoil the result of an otherwise perfect operation, and we desire to sound a note of warning to etherizers, who often attend to their responsible duty in a somewhat perfunctory manner.

THE NERVOUS MOTHER.[1]

By John Madison Taylor, M.D.,

Professor of Diseases of Children, Philadelphia Polyclinic; Neurologist to the Howard Hospital, etc.

A gradually ripening experience in the nature, peculiarities, and disorders of children leads me to value more and more early the exceptional opportunities for studying nervous women. Indeed, there seems to me so vital a connection between the condition of the offspring and the overshadowing much enfolding influence of the mother that I am at times inclined to rate this as of first importance in forming judgments on the little ones. Therefore, at your invitation to address you on a subject most condensed yet comprehensive among childish disorders (as the small compass of an hour admits) I am led unhesitatingly to choose the mother herself, to whom attention may, after all, be most usefully directed, in securing remedies for their offspring.

We all love to contemplate our eidos, or highest conception of the mother, the unspeakable beauty of which has alternately lured and baffled thinkers and poets since time was. Nothing is too good or can be claimed as too lovely in the way of description or praise for the ideal type of maternity, and that I leave to the consideration of those better

[1] Part of a lecture delivered before the Newman Society of the University of Pennsylvania, January 15, 1895.

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or wiser, or, at least, bolder than I. My theme is pre-eminently the practical one of discussing with you the ordinary every day, more or less flawful, and, indeed, too often accidental mother. One word, then, as to how women come to arrive at this distinction, privilege or martyrdom, as it is variously viewed by the owner. And let me say, beginning life a most pronounced optimist, I remain such with only the inevitable chipping off of sharper-cut edges. The better part of a score of years spent in ministrations to the ailments of overwrought humanity, the condition of whose disrepair most usually has to do with varying shades of individual blame-worthiness, has compelled me to note the less beautiful factors which mould and fashion an originally wholesome personality. It is then with regret I admit that the average mother too often disappoints me, though I hasten to avow that of superb beautiful mothers it has been permitted me to meet not a few. There is a crying need for a special training for those who possibly may become mothers, it is certainly demanded for those who are about to become such. But, first and last, this crowning embellishment and glory of womanhood comes in great measure as a surprise, nor always is it heartily welcomed, and only rarely does it bring unalloyed joy. An enormous amount of trouble and expense is taken to avoid the title, or at least the frequent repetition of the blessing, and a good deal of thrusting out of sight conscience as to the methods used. I am tempted to speak at length on this phase of modern civilization, but leave it with the remark that as soon as specific instruction in the duties, privileges, and glories of maternity shall replace much of the pseudo-science which is fashionable in our halls of learning so soon will we make great strides towards the solution of the common troubles and disappointments to which we doctors are subject while striving to do our utmost duty in furthering the expansion and betterment of our race.

It is safe to assume, then, that the mother realizes very little her responsibilities, be she of high or low degree, except it may be she has hastily devoured (and failed to assimilate) certain little books which are being offered in great numbers purporting to be "mothers' guides." Let us say nothing in disfavor of those treatises, because, poor as they often are, it is at least the only systematic teaching she is liable to get.

Again, this shortage in information is more marked in two directions, among the very poor and the very rich, while the maidens of the great middle class get more or less object teaching and opportunities to functionate as vicarious parent or caretaker to brothers and sisters, and thus early learn the practical duties of motherhood.

There seems to me one particularly promising avenue through which motherhood ideas shall be acquired. The kindergarten offers by far the best opportunities for children to learn their duties to them-

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selves and each other from the fundamental basis. Froebel's beautiful concept or system includes as assumed motherhood as the point of both departure and return. Thus the child learns its primal duties and privileges, and always in relationship to the mother, and not the least important part of the programme is that the concept of a perfect, all enfolding, infinitely wise and tender parent is produced. The feminine child will grasp this in a more practical way than the male, and consciously or unconsciously will form herself on similar lines. Such a girl will grow up a more womanly woman, will develop a wholesomer femininity than can be expected of any accidental methods. When in due course of nature children come to her they will find motherliness of infinite variety and scope passing the bounds of reasonable expectation. Thus through the expansion of this now happily widely growing system of education seeds of gravest importance are scattered, much of which will fructify in unexpected fashion and to the great advantage to mankind.

The first glimpse we doctors get of the family circle is often a scene of chaos and excitement begot of an emergency well defined or merely suggested, tangible and serious or purely fanciful. Medical practice is comparatively a simple matter in a well-ordered hospital with full opportunity for deliberate investigation and with skilled observers and helpers ready at hand. Into an ordinary household, however (where the customary march of the hours is rhythmical and well ordered from one comfortable domestic step to the next, where the capacities of the feminine head are chiefly taxed in keeping this admirable procession where each one knows his place in easy motion), let there come the horrible spectre of disease, and the whole equipoise may well be catastrophically lost. These are the trial times of the soul, when the inherent qualities of character quickly reveal themselves. It is a mercy medical men are trained to be discreet and silent, as well as prompt and decisive. The shallow woman, given over to pettiness and self-love, whose acquired clevernesses, moreover, enable her to pass current in the familiar exigencies of society, where alone her training and experience are acquired, has her thin vein of artificialities rudely jostled aside by the shadow of death. If she be a weakling, contemptible cowardice is probably shown. If strong, a selfish revolt at the discomforts about to fall upon her may be evidenced in a way to disgust the most forbearing. If, however, the mother be merely uninformed and ignorant, but well endowed with possibilities and, with all, eager to assume her proper place, then is the task to direct and aid an easy and pleasant one.

And here let me say we medical men not seldom earn the right to be "doctors" or teachers, so often does it fall upon us to teach the

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graver duties and accountabilities, so largely are we called upon to mould and train the unformed human character. It is a common experience for us to find that what we have a right to believe, and should be able to regard as specimens of excellent womanhood, are, when the test comes, but miserable mockeries, mere semblances of human souls. Nor is this usually the fault of the individual, rather her misfortune. Character, the highest jewel in our crowns, comes to perfection only through strife and suffering. And whether one has that within them of which character may be made depends solely upon suitable conditions for its development. Hence we may have the spectacle of sudden, swift, and dazzling soul-growth in an hour or a night at the magic touch of stern necessity and occasional critical juncture. And how gratifying it is to aid this personality, how unfalteringly can we serve and labor for such an one. But the reverse picture must be contemplated when the plummet of circumstances thumps dully in the shallows revealing the tiny soul to be but a picturesque nothingness.

Results are accomplished in this vale of co-operative suffering almost solely by mutual aid. Those of us who direct and counsel the family in matters of life-preserving and saving depend necessarily upon the intelligent support of those who are mentally and authoritatively competent; we cannot assume control unless invited and supported. We may be forced to look beyond the one in most direct authority if that person be incapable of wielding it, but it hampers us most sadly. There must be an intelligent court of appeal, however remote or feeble.

We may then divide mothers for purposes of special description into those who through ignorance or apathy, or both, concern themselves scantily as to their offspring or their woes and those others who, in excess of love or zeal or vanity, or from mere inherent fussiness, make more of their offsprings' corporeal states than circumstances actually warrant. The ignorant or lack-lustre parents are simple problems enough, and for the children of such are either the refuge of hospitals, homes, asylums, etc., provided in such lavish excess, or the trained nurse who, all said and done, gives very great satisfaction to both physician and baby.

We have here, however, naught to do with the consideration of the honest, wholesome, clean-hearted, ever-beautiful mother who earns the name through whole-souled endeavor (however short her varying capacities may fall), except to say, here and ever, God bless her, as He undoubtedly does.

We now arrive at the subject of our discourse, "The Nervous Mother," though that phrase all inadequately expresses what I have in mind, and I can only sketch out certain types and suggest how

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practical medical advisers may use our knowledge of these varying peculiarities to enable us to rightly assist the children.

Among the unexpected rewards of the physician's life is to see swift character growth, a maturity of mind and judgment the direct outcome of complicated exigencies and sudden responsibilities. My experience leads me to conclude that this most frequently occurs in the refined, well-educated women who have grown up in an atmosphere of comparative luxury.

I mean, to be more exact, that most often have I seen the dreamy, placid, or frolicsome maiden transform at a flash into a woman of clear judgment and robust fortitude among those whose uprearing occurred in an atmosphere of ample education and refinement, less often in the ranks of poverty (for there character-growth is apt to be checked by selfishness), and least often where youth was spent in that other and worse school of selfishness, "the unemployed rich."

In looking somewhat carefully over my experience, I am inclined to believe that a liberal education, not forced or unduly specialized, is an excellent foundation for wholesome motherhood. Even the college-bred woman, against whom the finger of scorn, at least of envy and bitterness, is too often pointed, is better fitted for maternity in body and mind than those who spend the corresponding years in aimlessness. And if a girl "finishes school" early and waits—for what? she stands in far more peril of various ills than if she had in many ways the inestimable advantage of college life and training.

Over-intellectuality, to be sure, is unwholesome, but is not so much a cause of physical deterioration as an evidence of unstable equilibrium in body or mind. The law of conservation in Nature's forces generally provides that among geniuses procreation is rare.

A difficult problem for a medical advisor is the highly educated woman of overlofty ideals, who becomes accustomed to sway the minds of colleagues in matters of literature, art, reform, religion, or, worst and emptiest of all, foreign missions. Children of such mothers are simple problems—to them—they should be seen or heard rarely from others. It is wrong and disturbing to be obliged to bring the mind down from realms of thought worthy of her brain and redounding handsomely to her lust for adulation to decide on points of petty education of right and wrong and childish plans and pleasures. Indeed, I for one do not advise that such a mother be kept very severely up to the line of maternal duties till the children grow up to her (comparative) intellectual level, provided a suitable caretaker and instructor be employed. These women may make excellent mothers to a maturing intelligence, whereas, by accident or design, they have lost capacity for the lower levels. You cannot expect a college professor of transcendentalism to be also a good kindergartener.

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Some women (and not masculine ones either), viewed in the light of their later history, are intrinsically unfit by natural qualities and tastes to bear the responsibilities of a family. It is enough for them to be wives, if, indeed, even here they fill their niche. At least they seem occasionally to present elements of well-sustained attraction to their husbands.

These might be classified as wives or companions, and so powerful is the masculine instinct of loving and protecting a mate to his liking that it appears to be enough for such to bask in this manly radiance, and maintain a moderately happy existence.

To these, however, children are accidental and usually regarded as disturbing incidents, endured in patience often, always a matter for surprise and confusion, and, finally, it may be, exciting pride and gratulation. The medical adviser here had best take control of the upbringing in conjunction with the father.

Some other women, in sharp contrast to these, plume themselves on a vivid interest in their flock and ruffle bravely in the face of society, conceiving plans and principles of hygiene, training, and education of startling iridescent vividness of the hues and stability of soap bubbles and of little more consistence.

These are easily advised, however, and usually have just enough of judgment to recognize adequate authority, and their children suffer little.

Some others again of this last type, but of more robust purpose, puffed up by the distinction of maternity, evolve foolishly conceived and hastily constructed views on the rearing of their offspring, which, aired before grandmotherly unwisdom, and thereby fortified in all their worst features, become a despair to the poor doctor, and a never-ending source of confusion. Not that I am intending to impugn the value of theories the product in part of unconscious instincts, provided they are left open and elastic to receive moulding impresses from expert advisers, for of such are the practical guiding principles of life frequently made.

And this brings me to a most difficult class,—those women who, possessed of some vigor of mind, but of no sufficient direction of thinking, and lacking due judgment, yet of tenacious purpose, conceive and assume theories of mental and bodily development based upon erroneous premises, bad physiology, and worse pathology, and who still enjoy the conviction that Heaven has sent them a precious and sacred charge which they are to unflinchingly accept It is not to be thought for one moment that their vigilance will falter or their judgment fail. They need no guidance in the underlying principles of life and growth. They may condescend to receive hints from a physician

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whose views have been thoughtfully investigated and found to coincide sufficiently with their own, but only in this special line, no more. And let him beware lest at any moment he be found wanting according to her standard of admissible views on diet or doses, for then must he give place to some other whose claims are more noisy, better known in her social sphere, or, finally, more wrapped in the delicious mysteries which surround the softly purring, sleek, and highly tactful pseudo-physician.

Again, there are those women who, do what you will to make clear principles and directions, yet seem unable to apprehend your meaning; who seize upon the least important hints and magnifying these lose sight utterly of the fundamental ones. They may be really intelligent, but so unbalanced, so lacking in powers of concentration or so astigmatic their conception of the meaning of words, that the lives of their charges are actually imperilled, especially when they begin "to use their judgment" here and there.

For such written directions of most minute explicitness are needed.

I may be permitted, perhaps, to say a word as to what sort of person, all things considered, makes the best mother. I will begin by uttering the platitude that there is a wide difference betwixt good judgment and high intelligence; also that the highest practical wisdom often resides in those who, with capacities for judgment, yet have their mind serenely open to the reception of knowledge, let this come from whatsoever source, direct or indirect, human or divine. The best mothers come from healthy-minded maidens who are happily free from the exuberance of adolescence. This whole subject of adolescence is of vital importance,—its tendencies, its possibilities,—and is only recently receiving attention at the hands of students. That foolish women are so fashioned by Nature and quite beyond their own control is true no doubt, but it is equally true and far more to the point that many of them could have escaped that fate if the element of choice which resides in all of us, supplemented by the moulding influences of teachers, had been by them more judiciously used. The critical times of the soul are many, but in the subdivisions of epochs none is of greater importance than the period of adolescence, just as the brain is expanding in energizing power.

The nervous mother, whom I had it in my mind to dilate upon, is that oft-recurring acquaintance who realizes her unfitness to judge and decide either from instability of mind or inadequate knowledge, and who is perpetually fluttering up and down her scale of apprehensions and rarely finding rest. She yields blind confidence to her medical confessor, even to the hurt of these dear ones in her agitated

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keeping if she be of a true and generous heart, or if an undercurrent of acidity vexes her soul she flies the track on small provocation, or none, and seeks a new advisor hoping for perfect wisdom; but doubtingly.

These women are of manifold variety. Some develop grandly; some degenerate surprisingly; some persist in self-abnegation, sacrificing all to the needs, real or fancied, of the children. Others suddenly become apprehensive on their own account, and under stress become hysterical invalids, imitating the disorders of their children even, or more commonly falling into a mixed state of ill health with picturesque trimmings, the outcome of prolonged tension on a relatively unstable nervous organization.

Some again suffer vicariously, but only psychically, others become permanently or, at least, seriously changed in body and mind.

And here treatment—prompt and efficient—must be directed to these women, both because they need and deserve it, but chiefly because their children, whom we are considering, demand it.

Too much prominence can scarcely be given to the importance of wisely directing the very earliest mental trend of the about-to-be mother, not only for herself in the formation epoch, but especially for the coming child. Strive to induce such folk to avoid brooding upon the gravity of coming responsibilities, nor let them vex their souls with technicalities at this late date, but depend rather on good wholesome advice, "a man chooses a course of action, but a woman chooses an advisor," whether it be a clerical or medical one. Never will a woman want a wise medical examiner so urgently as in this prematernal stage, and much can then be gained of wholesome mental attitudes, which will be the firm foundation of future wisdom.

And there, also, is the grandmother, possibly two of them, doubtful factors always, about whom I am almost too timid to speak, because they do mean so well. Their wisdom is usually accepted on all sides, a relic of ancestor worship, the sacredness of the father, the fundamental idea of reverence for knowledge. This is as it should be. The grandmother ought to exert a power for good second only to the priest. But absolute obedience is only possible nowadays when the reasons are in the main and collectively sound.

If, therefore, the grandmother has shown herself to be a conspicuously wise mother she has the right to exert grandmotherliness, provided she keep herself reasonably well informed on the hygiene of infants and others. But, alas! too often forgetfulness and serene self-esteem, the habit of being obeyed unquestioningly dulls the edge of knowledge and the shrivelled skeleton of the aforetime grandmaternal wisdom becomes quite useless. I knew a lady well who, after bringing

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forth a good-sized family, ceased to bear till suddenly, to the surprise of all, eight years after the birth of her youngest, appeared another baby. She often remarked to me how ridiculously her remembrance of little rules of nursery-conduct had slipped her memory just when she was depending most upon herself. I promptly called her attention to the fact that if this were true in the lapse of so short a time how little might one expect a grandparent, whose lines of thought grew up with her children, to change her point of view to suit their growing needs, and not continuing to improve the earlier and relatively scanty knowledge of children and their ways.

If the only fruit of much living is, as Thoreau remarks, the ability to do some slight thing better, there are higher and better things, no doubt, than concerning one's self with childish things.

The conditions, however, of doing even this well is to continue to dwell upon such matters, and by so doing brighten judgment, or else offer immature conclusions with becoming modesty.

MEMORANDUM.

REPORT OF A CASE OF HYPERTROPHIED PROSTATE TREATED BY CASTRATION.

THE patient, whose case is here reported, came to me February 13, 1895, with the following history: A native of Prince Edward Island, clergyman, aged 59 years, married, and father of six children. He had always been well, previous to the present trouble, which began two years ago with frequent micturition, which soon became difficult. He resorted to a catheter and has steadily continued its use. Last May he had considerable hemorrhage into the bladder, and at present he has a marked cystitis.

Examination showed the prostate enlarged to the size of a lemon, the left lobe being larger than the right. Two and a half ounces of residual urine were obtained by catheterization. This was foul, highly alkaline, full of mucus, pus, and crystals of triple phosphates. No casts could be found, but albumin was abundant. After treating the urine with KOH and magnesium fluid, however, the albumin was slight. The patient was placed upon a mixture to relieve the cystitis, and the bladder was washed daily with boric acid solution. After three weeks of this treatment there was no improvement; he was

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having night-sweats with chills and fever, and had to use the catheter every two hours. On March 14, I performed the operation of double castration.

The condition of the kidneys was fully appreciated by the patient and myself, but he insisted upon the operation, saying that he would rather die than continue to suffer as he had been doing. Chloroform was selected for the anesthesia, and the operation itself was a success, the stitches being removed on the eighth day without a drop of pus having appeared.

About the twelfth day after the operation, the temperature became elevated, symptoms of uremia set in, and on the evening of the fifteenth day the patient died. After the operation the patient was able to micturate with greater ease, and there was but half an ounce of residual urine.

Examination of the prostate after death showed it to be about one-half its former size.

I report the case because at present these operations are looked upon by the profession with considerable interest; and because there was such an early and decided diminution in the size of the prostate gland. There are sure to be a number of deaths following this operation, because of the advanced kidney-disease which exists in so many of them; and I do not feel discouraged from operating again when the indications are clear.

J. A. LICHTY, M.D.

CLIFTON SPRINGS, N. Y.

ALUMNI NOTES.

COMMENCEMENT WEEK.

THE first "commencement week" in the history of the University of Pennsylvania has passed, and will long be remembered as a most pleasant and successful occasion, and as inaugurating a custom which must tend towards the unification and increased prosperity of this venerable institution of learning. The Commencement Week Committee deserves the thanks of the alumni and friends of the University for its painstaking care in planning and carrying out the extended programme, which follows:

Friday, June 7. 10.30 A.M.—Class-Day Exercises by the Graduating Class of the College at the Chestnut Street Opera House.

Sunday, June 9. 11 A.M.—Sermon to the Graduating Class of all Departments by the Rev. John Sparhawk Jones, at Calvary Presbyterian Church.

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Monday, June 10. 8 P.M.—Ivy Planting Exercises, College Campus. 9 P.M.—Senior Promenade in Library and on Campus.

Tuesday, June 11. 9.30 A.M.—The Graduating Classes of the College Department and the Undergraduates of all Departments assembled at College Hall. 10 A.M.—The Provost, Trustees, and Faculties of the University assembled at College Hall to meet the Governor of the State, and his Staff and the Mayor of the City. 10.15 A.M.—The Graduating Classes and Undergraduates formed in procession and escorted the Governor, the Mayor, the Provost, the Trustees, and the Faculties from the College Campus to the Academy of Music. 11 A.M.—The Annual Commencement Exercises, marking the one hundred and fifty-fifth year of the University's life, were held. Mr. Charles C. Harrison, who has been Acting Provost since the resignation of Dr. William Pepper, was inducted into the office of Provost by Governor Hastings. 7 P.M.—Annual Meeting of the Society of the Alumni of the College in the College Chapel. This was followed by the Alumni Collation in the Library. 8 P.M.—Annual Commencement Exercises of the Philomathean Society in the College Chapel.

Wednesday, June 12.—Alumni Day.—General reunion of the Alumni of all the departments of the University, and first meeting of the General Society of Alumni of the University of Pennsylvania. The following officers were chosen: *President*, Wm. Pepper, M.D., LL.D., '62 C.; *Vice-Presidents*, the Rev. George S. Fullerton, D.D., '79 C., from the College, Horatio C. Wood, M.D., '62 M., from the Medical School, Hampton L. Carson, '74 L., from the Law School, James Truman, D.D.S., from the Dental School, and John Marshall, M.D., '78 M., from the Veterinary School; *Secretary and Treasurer*, W. L. Winner, D.D.S., '85 D. 8 P.M.—Annual dinner of the Society of the Alumni of the Department of Dentistry. 8.30 P.M.—Banquet of the Alumni Society of the Medical Department. 8 P.M.—Glee and Banjo Club concert and exhibition by members of the Gymnasium Team, at the Chestnut Street Opera House.

Thursday, June 13. 11 A.M.—Commencement Exercises of the Medical, Dental, and Veterinary Schools. A portrait of the late Dr. William Goodell was presented to the University by his family. A bust in bronze of the late Dr. Joseph Leidy was also presented. A portrait of Dr. H. C. Wood was presented by the Horatio C. Wood Medical Society.

Degrees were conferred by Provost Harrison upon 250 graduates of the Medical Department, 70 graduates of the Dental Department, and 18 graduates of the Veterinary Department. The Valedictory address was delivered by Professor H. C. Wood.

The following prizes were awarded:

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The "Alumni Medal," with an accompanying purse of $50, to the member of the graduating class who attained the highest general average in examination, was awarded to William Pomp Walker.

The prize of $100, offered by an alumnus to the member of the class graduating in June, 1895, who presents the best thesis descriptive of original research in physiology, was awarded to Joseph P. Walsh, with honorable mention of the thesis of Leedom Sharp.

The prize of $100, offered by a friend of the department to the member of the graduating class who passes the best examination in obstetrics, was awarded to Walter B. Denslow, with honorable mention of William Pomp Walker.

The prize of $25, offered by a friend of the department to the member of the graduating class who passes the examination of therapeutics, was awarded to W. Wayne Babcock.

The prize of a Thoma-Zeiss blood-corpuscle-counting apparatus and a Fleischl hemometer, offered by the Professor of Clinical Medicine for the best report of his clinics during the session of 1894–95, was awarded to Louis E. Livingood, with honorable mention of the reports of William Schleif and John De Vinne Singly.

The prize of a pair of obstetric forceps, offered by the Professor of Obstetrics to the member of the graduating class furnishing the best report of a case occurring in the University Maternity Hospital, was awarded to Charles E. Quetil, with honorable mention of the report of Leedom Sharp.

The prize of a copy of Treves's "Operative Surgery," offered by the Professor of Clinical Surgery to one member of each of the four surgical ward class sections for reports of that service, were awarded respectively to William Stump and Francis D. Patterson, with honorable mention of the report of Joseph P. Walsh.

The prizes of a surgical pocket-case and a copy of Treves's "Operative Surgery," offered by the Professor of Clinical Surgery for the best reports of his clinics during the session, were awarded respectively to James J. Walsh and William Schleif, with honorable mention of the report of A. Barr Snively and Charles E. Quetil.

The two prizes offered by the Demonstrator of Surgery were awarded as follows: A surgical pocket-case for proficiency in fracture-dressings and in operative surgery, to Harry J. Chapman, of the graduating class, with honorable mention of Samuel W. Hopkins and N. Homan Burt. A surgical pocket-case for proficiency in bandaging, to Alfred R. Allen, of the first-year class, with honorable mention of Alfred W. Myers and Harry M. Anderson.

The prize of a copy of "Ashhurst's Surgery," offered by the Demonstrator of Osteology to the member of the first-year class who

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passes the best examination in osteology, was awarded to Frederic H. Howard, with honorable mention of J. Weir Grissinger and Eugene T. Hinson.

The Zentmayer prize of a microscope for the best examination in history and embryology was awarded to Clarence W. Willie, with honorable mention of J. Ross Mossgrove, Jr.

The prize of $25 offered annually by the D. Hayes Agnew Surgical Society to the student preparing the best anatomical preparation in the dissecting-room was awarded to Elmer E. Neff and Charles W. McConnell, of the second-year class, for their joint preparation, with honorable mention of the preparation of William F. Dager.

The prize of a case of autopsy instruments, offered by the Demonstrator of Morbid Anatomy for the best report of his autopsies, was awarded to Joseph P. Walsh.

The prize of a hemocytometer, offered by the Lecturer on Physical Diagnosis to the member of the first-year class who presents the best report of his lectures on physical diagnosis, was awarded to Harry C. Westervelt, with honorable mention of the reports of James Bringhurst and George M. Gates.

The Dr. Louis J. C. Kimmell prize of an antiseptic minor operating-case, offered to the student who presents the best thesis on a surgical subject, was awarded to James J. Walsh, with honorable mention of F. N. Robinson.

The prize of a surgical pocket-case, offered by the Demonstrator of Anatomy to the member of the graduating class who presents the best record of anomalies found in the anatomical rooms, was awarded to James J. Walsh.

The prize of a copy of Treves's "Operative Surgery," offered by the Clinical Professor of Genito-Urinary Diseases for the best thesis on a clinical study of cases, was awarded to Francis D. Patterson.

The prize of an antiseptic minor operating-case, offered by the Professor of Orthopedic Surgery for the best practical work in orthopedic surgery, or for the best report of his clinic, or for an acceptable original design in apparatus, was awarded to James J. Walsh, with honorable mention of D. Cameron Bradley and James M. Ward.

The prize of an axis-traction forceps, offered by the Hirst Obstetrical Society for the best examination in operative obstetrics, was awarded to James J. Walsh, with honorable mention of Irving H. Rankin.

The following prizes were awarded in the Department of Veterinary Medicine:

The J. B. Lippincott prize of $100, awarded to the member of the graduating class who, in the three years spent in the Veterinary De-

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partment of the University, attains the highest general average in examinations, to Ulysses G. Houck.

The prize of an écraseur, offered by a friend of the department to the member of the second-year class who passes the best examinations in veterinary anatomy, was awarded to Herman A. Christman.

Dr. John Ashhurst, Jr.'s, Remarks in Presenting the Portrait of Dr. William Goodell.

Mr. Provost, Gentlemen of the Board of Trustees, Ladies, and Gentlemen,—I feel it a high honor to have been asked by the family of my late colleague and dear friend, Dr. William Goodell, to present on their behalf and in their name to the University of Pennsylvania a portrait which shall be placed among those of the many eminent teachers of our Medical School in the days that are past, and which shall perpetuate to all future generations the memory of one not less distinguished than the greatest of his predecessors. For more than twenty years Dr. Goodell's name and personality have been a tower of strength to this University. Students from all parts of the world have gathered in our lecture-rooms, attracted by his wide-spread and deserved reputation as a sound and eloquent teacher. Patients from East and West, from North and South have sought in our hospital wards to obtain the benefit of his diagnostic insight into the nature of obscure diseases, and of his marvellous operative skill in their successful treatment; which wherever the English language is known his printed words have been scanned and his lessons eagerly conned by hundreds and thousands of readers who have recognized that the wisdom and judgment displayed by his writings have been only equalled, not surpassed, by the literary charm which has enhanced their influence. At our annual commencements no form upon this platform has attracted more attention, no presence has been more eagerly watched for by strangers; none more reverently and affectionately looked upon by his pupils than his whose absence we this day deplore. When the inevitable hour comes, hands, even the busiest, rest from their labors; minds, even the most brilliant, cease from their occupations; and man leaves the scene of his toil and of his pleasure, of his conflicts and of his victories, to meet the Eternal Judge and render his account to his Maker. *Stat nominis umbra* (but the shade of a name remains). But, friends of the University, alumni, students, while time lasts let us cherish the memory of our departed associate; and let the name of William Goodell be ever an example and an inspiration to all who bear the honored title of physician to lay out their lives loyally and liberally to the glory of God, and for the benefit of their fellow-men.

Dr. Horace Howard Furness's Address in Receiving the Portrait of Dr. Goodell.

I wish I could portray to you in the clear colors memory paints for me the vision that rises before me of a young man whom I met more than a generation ago as I was leaving his father's door in Constantinople. There stood before me the glow of health, the elastic activity of youth, the ready interest in the topic of the hour, and, above all and beyond all, the exquisite smile of kindly and instantaneous sympathy. It needed but little intercourse to reveal that beneath these attractive lineaments there were the elements of character whereof the happy mingling of that faculty whereby man brings to a focus the results of a whole

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horizon of observation; of that calmness in emergencies, coupled with fertility or resource; of that unerring glance which pierces through a web of confusing symptoms to the very centre of the disease, and of exquisite urbanity,—all those elements, I say, produced in the fulness of time, that man, that physician, that professor, that friend, whose portrait the University, through me as her representative, accepts, and is honored in accepting. It is, indeed, a high honor to be able to place before the young men who flock to her gates the flawless example of such devotion to the highest standards of duty. Happy the university that in the revolving years can cover her walls with such memorials! Thrice happy the students who can draw inspiration from such models. Remember, ah! remember (and if I preach to you, bethink you that a text is mine), remember that now in the omnipotence of youth you can train your powers to reach my height,—the greater the height, the higher the success. Emerson says, in uncouth phrase, "Hitch your wagon to a star." And even if you fail, to fail on a high aim is better than to succeed in a low one. 'Tis the pursuit that ennobles, not the solitary successes that we won. And what a pursuit is yours! You are privileged not alone to read in Nature's book of mystery and to enter her secret councils, but the lofty guerdon is yours of entering heaven before death. At the close of your life, when the snow is heaped on your head, as Dr. Holmes says, to cool the hot blood of youth, you will have found out what shadows we are and what shadows we pursue,--and all the pageant of life will be but a misty dream then from this land of dreams. You, too, can enter that heaven into which he entered long before his death and took possession by the royal right of eminent domain; that heaven wherein he dwelt, built, and fashioned by the deep blessings of gratitude rising from happy hearts when in sallow wit he had planted rosy health.

"There is a dream of maturer years,
More turbulent by far;
A vision of blood and of woman's tears,
For the theme of that dream is War.
And we toil in the field of danger and death
And we shout in the battle's array
Till we find that Fame is a bodiless breath
That vanishes away.

"There is a dream of hoary age,
A vision of gold in store;
Of sums noted down on the fingered page,
To be counted o'er and o'er.
And we fondly trust in our glittering dust
As a refuge from grief and pain
Till our limbs are laid in their last low bed,
Where the wealth of the world is vain.

"And is it thus from his birth to his grave
In the path that we all are treading?
Is there naught in man's career to save
From remorse and self-upbraiding?
Yes! there's a dream so pure, so bright,
That the mortal to whom it is given
Has bathed in a sea of living light
For the theme of that dream is Heaven!"

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DR. HARRISON ALLEN'S REMARKS IN PRESENTING BUST OF DR. JOSEPH LEIDY.

MR. PROVOST,—I have been asked to make a few remarks on behalf of the friends who present the bust of Joseph Leidy to the University. Four years have passed since the death of Professor Leidy and the poignant sense of loss has given way to the calmer mood of reflection. The materials for biography do not rest only on the reminiscences of contemporaries. These must be supplemented by the methods of the historian. The time has not come to use these methods to frame an estimate of Joseph Leidy. But enough is at hand to enable us to know something of the man whose memory we honor to-day.

His reputation is as wide as the cultivation of science itself. In London, Paris, Berlin, and Vienna he was as well known as a savant as he was in Philadelphia. The visitor to the cave of Luray has pointed out to him, among the fantastic groupings of stalactites, the majestic Leidy column. The whaler sights Cape Leidy on the ice-bound coast of Grinnell Land. In northern Greenland the Leidy Glacier fronts on Inglefield Gulf. The traveller sees the granite peak—Mount Leidy—towering nearly 12,000 feet above the plains of Wyoming. Little children learn of these facts in Philadelphia, from books they carry along Leidy Avenue to the Joseph Leidy Public School.

We cannot claim this man, all we can do is to pay our tribute to his worth and say to the world, "He is now yours who once was ours." How did these things come about? Leidy was born in 1823 in Philadelphia in an humble station. He had no powerful friends who were not of his own making. He studied medicine and spent all of his days here in quiet pursuit of his profession as teacher and investigator of anatomy. The answer to the question is simple. These things came about through the sheer force of intellectual strength and character.

Some great men excite our emulation; others our wonder. Without social position or wealth Leidy took a distinguished position in society. Without teachers he developed in exceptional degree an artistic facility. He obtained at twenty-five a maintenance by which he could consecrate his energies to study; and by thirty secured the chair of anatomy in the University. Save in the matter of the formation of a literary style, Leidy wielded at twenty years powers as mature as those he evinced at any period of his career.

He was blessed in having a sound mind in a sound body. He made no enemies,—the first glance prepossessed one in his favor; the first sound of his melodious voice held one as in a charm. He was placid in disposition, amiably disposed to all men, and gifted with a fine sense of humor, which kept him in good form for resisting the carking care of this work-a-day world; and all without apparent effort,—without apparent discipline or self-denial.

His powers of perception were phenomenally developed, and were equalled only by the conservativeness of his judgment. His personality was immense. He was one of those men that passers-by in the street would stop and look after. He was democratic to a fault. He was approachable by all, and it is a question where he showed to most advantage,—in the University, lecturing on anatomy; in the halls of the Academy of Natural Sciences, announcing his discoveries; at Swarthmore College, teaching the rudiments of natural history to boys and girls; at the Wagner Institute of Science, delivering popular lectures; or in the market surrounded by fishermen listening to his talk on the curiosities they would put aside for him from their nets.

He was fortunate in many things which had no relation to ability. He was fortunate in the nature of the country about Philadelphia which was admirably adapted to aid him in making biological discoveries. He was especially fortunate

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in being at hand when the wonderful page in the history of the globe was being read from the fossil beds of the great West. But above all things was he fortunate in being so placed that his task of uniting teaching with research was made possible. We in our turn are fortunate, indeed, in having had such a man with us, to have had his name enrolled among the great in the honor-list of the Alumni.

Those who have been favored with his friendship, those who have listened to his teachings, do not need the bust or storied urn to aid them in keeping his memory green. In order that that larger number of the Alumni, who never heard the sound of his voice, may have now in enduring bronze the semblance of that Jove-like head, this splendid effort of Mr. Boyle has been consummated. Accept it, sir, as one of the most precious of our possessions. May that calm visage forever illumine the halls of our Alma Mater, and the life of Joseph Leidy be an active force, to which future generations will turn with pride and admiration.

WALTER GEORGE SMITH'S REMARKS IN RECEIVING THE BRONZE BUST OF DR. LEIDY.

The name of Joseph Leidy is world-famous among men of science, and it is one of the glories of the University that he was her son. For half a century his name and work were associated with her. It is fitting therefore that this image of this strong and benevolent head should have its niche in her halls. On behalf of the Board of Trustees I am deputed to accept with grateful thanks this memorial of a man whose fame is her pride, whose works in science were so often carried on in her laboratories and lecture-rooms, whose character has set its seed upon so many graduates. Such a man, even among the choice spirits, when it is the peculiar advantage of a seat of learning, to gather from the common walks of life, is not often raised up to show by word and example the power of industry and genius. Let his career teach us a lesson that as short as is the span of earthly life it suffices to work out some of the problems of nature. To learn something of "the depth of the riches of the wisdom and of the knowledge of God, how incomprehensible are His judgments and how unsearchable are His ways." It has been finely said by a living English poet that human pleasure in almost all the relations of life, even the purest and the most unselfish, are always mixed with pain, and therefore nature itself shows us that they were given rather for our discipline than for a complete satisfaction. But the study of nature herself is one of unmingled pleasure; none but the serenest and most encouraging emotions follow from the knowledge of her phenomena, whether they be observed in the animate or inanimate works of the Creator's hands. As we contemplate the results of Leidy's life, and follow in imagination "the patient search and vigil long" with which he gave himself over to the study of nature's mysteries, we may become better and more hopeful men. He truly said of himself, that he knew a little of natural history, and proposed to teach others a little of that little. "Gladly wolde he teche and gladly lerne." With the true spirit of true science the vastness of his acquirements made him more humble, for he knew that however profound a knowledge he might attain to, he must ever stand confronted with mystery. Mystery unsolvable by human effort alone. It is given to but few men to accomplish so much as he did, but it is given to every true man and true student, to take up his allotted work in the same spirit of patience and industry.

Far away from this city of his birth, his life's work and affection, there arises a mountain that lifts its head into the clouds, a noble monument of nature, and to that monument has been given the name of Leidy. As it towers a landmark

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among the forests and plains of the West, so will his fame stand out grand and beautiful in the minds of students who love nature, and seek to find something pure and ennobling in the smallest as in the greatest of her works.

Mr. Gitting's Address in Presenting the Portrait of Dr. Wood.

Mr. Provost, Ladies, and Gentlemen,—Some thirteen years ago there was organized under the patronage of Professor Horatio C. Wood the Society which upon this occasion I have the honor to represent.

During that time, so successfnl has been the society in developing the spirit of scientific investigation, in disseminating the germs of general medical culture, and in fostering the sentiments of professional comradeship and sympathy that to-day it is not only distinguished for large and earnest undergraduate membership, but has also become a distinct, an integral part of University medical life.

On the roll of its Alumni are some of the most brilliant and successful of the younger professional careers. These beneficent effects of our Society upon our collegiate life, and also upon our after years, we attribute wholly to the personal influence, to the wide scientific experience, and to the paternal interest of our beloved and distinguished patron, Dr. Wood. Therefore, Mr. Provost, in view of the widespread personal influence exercised by our patron upon so large a phase of University life, we, the members of the Society organized in his name, have thought that this, his portrait, would prove a not unacceptable gift to our Alma Mater. We do this from an earnest sense of the appropriateness of the gift, and from the deep feeling that, of the many famous men who look down from her walls, none is more worthy of a place then he.

Mr. Provost, I take great pleasure in presenting to the University of Pennsylvania this portrait of Dr. Wood.

Judge Pennypacker's Address in Receiving the Portrait of Dr. Wood.

The city of Philadelphia, where in this time-honored school medical instruction upon the continent of America began, has ever since continued to be the centre towards which those who desired education in the healing art for the most part turned, and it still is the most prolific source of such instruction. The maimed and the halt, and the sick from the Atlantic to the Pacific, the sufferers from cold in the frozen North, and from heat in the sunny South may well pour out blessings on the medical school of the University of Pennsylvania. The fame of her learned teachers, of Morgan and Rush and Leidy and Agnew, has become a part of the heritage of the world. The past is gone, leaving only its memories and its example, but the present is before us with its duties, and the future beckons with its promise. Dr. Wood, of that present and future whose portrait is now presented to the University, with which he has been long associated, is a fitting successor of the worthy men who have so made our medical annals illustrious. An eminent teacher, a practitioner of rare skill and attainment, an author who has enriched the literature of his profession with over forty books and pamphlets, he is, moreover, a typical representative of those peaceful people from whom he derives his lineage, modest in assertion, and efficient in performance. The Board of Trustees of the University of Pennsylvania therefore gratefully accept this portrait as an evidence of the worth and skill of their time, and an example for the generation to come.

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The Annual Meeting and Banquet of the Alumni Society of the Medical Department.

The annual meeting of the Alumni Society of the Medical Department of the University of Pennsylvania was held at eight o'clock on Wednesday, June 12, in the Bullitt Building.

The report of the Executive Committee showed that the membership is gradually increasing, and that the finances of the society are in an improved condition. During the year fifteen alumni died. It was decided to add $50 to the society prize for the highest general average of a member of the graduating class of the medical school. The election of officers resulted as follows:

President, Traill Green; *Vice-Presidents*, Meredith Clymer, Claudius Mastin, Hiram Corson, William Hunt; *Secretary and Treasurer*, Joseph P. Tunis.

Executive Committee, Horace Y. Evans, John Ashhurst, Jr., R. A. Cleeman, Samuel S. Stryker, Roland G. Curtin, De Forest Willard, S. D. Risley, William Barton Hopkins, John B. Deaver, John H. Musser, Charles W. Dulles, Thomas R. Nelson, Judson Daland, Harry H. Whitcomb, Elliston J. Morris, David B. Birney, B. F. Stahl, H. M. Hiller, Jr., Alexander R. Craig, Collin R. Clark.

The annual banquet was held immediately after the business meeting, Dr. R. A. Cleeman presiding. The following toasts were responded to: "The University," by Dr. William Pepper; "The Trustees," by Judge Pennypacker, and "The Alumni," by Dr. H. C. Wood.

Meeting of the Philadelphia Alumni Society of the Medical Department of the University of Pennsylvania.

On Saturday evening, May 18, the Philadelphia Alumni Society of the Medical Department of the University of Pennsylvania held its last meeting for the present season at the Colonnade Hotel. The annual business meeting was held at 8 o'clock P.M., when the following officers were elected for the ensuing year:

President, Dr. Wharton Sinkler.

Vice-Presidents, Drs. Henszey, John Marshall, W. Baker, C. S. Gauntt, W. W. Naylor, H. Toulmin.

Treasurer, Dr. S. S. Kneass.

Recording Secretary, Dr. H. Toulmin.

Corresponding Secretary, Dr. B. F. Stahl.

Executive Committee, Dr. S. D. Risley, chairman; Drs. J. A. Scott, Henry Blates, Alfred Stengel, H. B. Carpenter.

The usual collation followed, at which there was a very large attendance.

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Addresses were made by Dr. R. Beverley Coles, of San Francisco, Professor H. C. Wood, Dr. James W. Walk, and others.

Gifts to the University.

The George L. Harrison Foundation for the Encouragement of Liberal Studies and the Advancement of Knowledge.

The Provost, Mr. Charles C. Harrison, has given to the University the magnificent sum of $500,000, in memory of his father. It is stipulated that the principal of this fund must be retained intact, and that no portion of the income shall ever be used in the erection of buildings, the endowment of a professorship, or in any permanent appropriation. The uses to which the income may be applied has not as yet been fully determined, but the following has been suggested:

(1) The establishment of scholarships and fellowships intended solely for men of exceptional ability.

(2) The increasing the library of the University, particularly by the acquisition of works of permanent use and of lasting reference to and by the scholar.

(3) The temporary relief from routine work of professors of ability in order that they may devote themselves to some special and graduative work.

(4) The securing men of distinction to lecture, and, for a term, to reside at the University.

A Gift of $600,000 by Mr. E. A. W. Hunter.

By the will of the late Mr. E. A. W. Hunter, about $600,000 will revert to the University upon the death of the widow and an only child. The gift is to develop the department of Clinical Surgery, and is left in memory of the late Dr. D. Hayes Agnew and Dr. Charles Hunter, a son of the testator, who died several years ago. Dr. John S. Billings and Dr. J. William White are named as trustees of the fund.

The Thomas A. Scott Amphitheatre.

Mrs. Thomas A. Scott has donated $5000 to the University to be used in fitting up the amphitheatre of Clinical Surgery in the new Agnew Pavilion; it is to be called the "Thomas A. Scott Amphitheatre."

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EDITORIAL.

THE PRESENT STATUS OF HYSTERECTOMY IN PUERPERAL SEPSIS.

WHAT is the proper management of puerperal sepsis? It is probable that the abdominal surgeon does not encounter a more perplexing and yet a more intensely practical problem than this. When it is remembered that the mortality of childbirth, now happily reduced to less than one per cent. in large communities, is in main part due to septic infection, and that these fatal cases frequently pass under the knife of the surgeon, it becomes evident that a better understanding of this insidious condition is essential to its more successful treatment. Thanks to the ghastly revelation of the autopsy table, we have now reached that period at which we can claim at least a working basis upon which we may confidently hope to establish a radically improved plan of campaign in dealing with puerperal septic infection.

As seen in the light of recent investigations, and especially as elaborated in the discussions of representative medical bodies, septic puerperal patients resolve themselves into two great classes,—namely, those in which the infective process is localized in the pelvis and those in which a general systemic involvement has followed upon the local infection. Experience has proven that once the infectious principle has spread beyond the confines of the pelvis and is coursing through the vascular and lymphatic systems or is creating havoc in the general peritoneal cavity, the period for the institution of successful operative treatment has been passed. While not absolutely hopeless, the almost invariably fatal result that follows closely upon the attempt at radical extirpation of the primary seat of infection might well make even the boldest champion of modern surgery withhold his knife. It is while the disease is localized within the pelvic cavity that the golden opportunity for true surgical conservatism is offered. Unfortunately the dividing-line between simple intra-uterine treatment and total extirpation of the diseased organ is not closely defined, and it becomes almost impossible to state in any given case just when the curette should be abandoned for the knife. One statement can be made dogmatically, however, and that is that simple removal of the appendages—although probably the seat of suppurative inflammation—is generally worse

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than useless in such cases. As has been remarked by an eminent abdominal surgeon, the uterine walls in these septic cases constitute nothing more nor less than one immense abscess-sac. If this be true, what benefit can be expected from oöphoro-salpingectomy? Equally unavailing will curettage of the uterine mucosa be in destroying the foci of septic infection in the walls of the organ.

It appears, therefore, that the favorable period for hysterectomy for puerperal sepsis lies somewhere between the first few days after the infection and its generalization. The vast majority of the operations performed after the seventh or eighth day of the disease have thus far resulted fatally, while those performed earlier have almost as uniformly resulted in a perfect cure. One would seem justified in suggesting some such course as the following: Given a puerperal patient with fetid lochia, high fever, rapid-running pulse, and marked pelvic manifestations, thorough curettage of the uterine cavity under the most approved antiseptic precautions should be performed, and drainage secured. If but slight improvement, as indicated by a moderate fall of temperature, follows, and the rapid-running pulse persists, a second curettage may be attempted twenty-four or forty-eight hours later. If no marked improvement follows, it would be proper to perform an abdominal section with the view of accomplishing a supra-vaginal hysterectomy, should direct examination of the uterine body reveal a spongy and boggy condition of its walls, even though the appendages have not as yet participated in the septic process. It is certain that once the disease has exceeded these bounds, hysterectomy, which would then become inevitable, will be performed under very adverse circumstances, and the patient will be denied the chances which an operation performed twenty-four or forty-eight hours earlier would have afforded her. True, it is impossible to state dogmatically that this patient would not have recovered without operation, but in the light of our present experience the balance weighs heavily against such a fortunate termination. Viewed from an impartial stand-point, this would seem to be the position held to-day by the conservative surgeon whose duty should be to preserve life, even at the expense of an important organ, the preservation of which would jeopardize the patient's existence. Not a voice can be raised against the operation when absolutely indicated. The only question that arises is, When do the indications exist, and what are they? Additional weight of evidence taken from the new basis alone can definitely answer.

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MEDICAL PROGRESS.

MEDICINE.

UNDER THE CHARGE OF

WILLIAM PEPPER, M.D., LL.D., AND JAMES TYSON, M.D.,

ASSISTED BY

M. HOWARD FUSSELL, M.D.

Fatal Acute Parenchymatous Nephritis in the Course of Impetigo.

Celoni (*Archivio Italiano di Pediatra*, July, 1893) reports a case as follows: A boy, five and a half years old, was seized with impetigo, which began in the face and rapidly spread over the entire body. After the patient had been ill three weeks, fever, and edema of the face appeared, followed in a few days with hydrothorax and ascites. The urine contained albumin. Four days after the appearance of the edema the child died. At the section a marked epithelial necrosis of the tubules of the kidney was found, with little change in the glomeruli. *No* micro-organisms were found.

First Aid in Electrical Accidents.

Hedley (*Lancet*, February 2, 1895) says that the purely medical aspect of electrical accidents may be summed up roughly in Arsonval's rule, that "one suffering from electric shocks should be treated as one who is drowned," not forgetting, however, that syncope rather than asphyxia is sometimes the prominent symptom. If the body of the injured, however, is still in contact with the electrical circuit there are three possible conditions to be considered.

(1) The body by contact with two conductors of different potentials may have short-circuited the current. Such a contact is usually at once fatal.

(2) The body in contact with one conductor may have taken part of the current to the earth. The gravity of this accident will depend upon the nature of the contacts.

(3) The body by being in contact with two points of the same conductor—*e.g.*, holding by both hands—may have become the seat of a derived current. This in itself is the least dangerous of the accidents.

Whatever the nature of the accident the first thing is to stop the current if possible. If this is not practicable the body of the injured person must be detached at once from the conductor. The "first aider" must in self-defence insulate himself from the conductor, the body of the injured, and the earth. To do this the hands must be covered with several layers of some *dry* material, such as several thicknesses of a garment. He must at the same time stand upon some dry wood, clothes, or straw. He may then detach the body from the conductor, and at the same time lift it from the ground. If at all practicable the current may be stopped by cutting the wire, or it may be short-circuited by placing an iron rod between it and the ground.

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Recovery from a Large Dose of Cocaine.

Walker (*Lancet*, February 2, 1895) cites a case of a man who had swallowed eight or nine grains of cocaine. His symptoms were constriction of the throat and region of the heart; great difficulty in swallowing; mental dulness. The pupil light-reflex was absent and the pupils were dilated. His appearance was that of a person partly under the influence of alcohol, but the most striking feature was the state of the muscular system; he resembled a bad case of chorea; the movements were slower, however, and more regular. The body was alternately rotated from side to side and bent at the same time, while the arms and legs were not still for a moment. He appeared to be constantly masticating, but could not swallow. There was some lividity of the lips. Amyl nitrite was administered with immediate benefit. All of the symptoms disappeared in about five or six hours.

Enteric Fever in Children and Infants.

Stowell (*New York Medical Record*, March 16, 1895) concludes a clinical study of this subject as follows:

(1) The disease is common in childhood and not more rare in infancy than is explained by lack of exposure. (2) The types and varieties do not differ materially from those of adults. (3) The duration is shorter, because the tendencies in childhood are more towards growth and repair than in the adult. (4) The prognosis is best in children because they have healthy organs and so few complications. (5) In infants the mortality is great because of the feeble conditions of the subject. (6) Those who die of enteric fever die as do adults of perforation or exhaustion.

Treatment of Nocturnal Incontinence of Urine in Children.

Chéron (*L'Union Médicale*, April 6, 1895) divides the treatment into,—

(1) *Mechanical.*—This is usually considered useless and brutal, but the meatus may be occluded by collodion at bedtime, which can be removed in the morning, or an elastic bag may be introduced into the rectum or vagina (?). Tienhovers considered incontinence due to insufficiency of the vesical sphincter; he lifts the foot of the bed at night and thus secures good results in many cases.

(2) *Hygienic Treatment.*—The amount of liquid should be limited and none taken with the evening meal. Cold perineal douches should also be given. The child may be wakened once or twice during the night. The sphincter may be educated by retaining the urine as long as possible in the day.

(3) *Moral Treatment.*—The child should not be punished. The hypnotic suggestion has been tried in a number of cases with excellent effect.

(4) *Medical Treatment.*—Belladonna and atropine can be used in such a way as to get their full physiological effect. Strychnine in full doses can also be given with excellent effect. Antipyrin, thirty grains, may be given in the course of ten days. Chloral and bromides may be given where there is a sensibility of the mucous membrane of the bladder.

(5) *Electrical Treatment.*—Either the constant or faradic current may be used and must be applied directly to the sphincter. Massage of the sphincter directly by introduction of one finger into the rectum may be practised. Several other methods which seem to the abstractor would be rather harmful, morally, than beneficial.

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Esophageal Varicose Veins.

Friedrich (*Deutsches Archiv für klinische Medicin*, Vol. LIII, Parts 5 and 6) reports a case of varices of the esophagus, which is of especial interest, occurring in a girl 6 years of age. Because of the symptoms a diagnosis of gastric ulcer was of necessity made. Hemorrhage, the predominant symptom, occurred for the first time a year and a half before her death. A few months before her death, following great loss of blood through vomiting and bloody stools, there developed a very aggravated attack of chorea, which, running a rapid course, ceased at the end of three weeks. After the lapse of two months another very severe hemorrhage took place and the child died. At the autopsy, the ventricles of the heart were found much dilated and the heart-muscle soft and flabby; the free edges of the mitral valves were slightly thickened, and on the anterior leaflet a small reddish-gray, soft deposit. The liver, kidneys, spleen (enlarged) showed fatty degeneration; the portal vein, the thoracic duct, the vena azygos, and the other contents of the thorax and abdomen, excepting the esophagus, were unchanged. The esophagus was the seat of great varices which consisted of two sets of vessels anastomosing with each other, one being thicker (size of a lead-pencil) and much more tortuous than the other. These vessels took their origin in two stems which came through the gastric muscularis under the mucosa, about two centimetres below the cardiac orifice. Arising thus they ascended perpendicularly through the esophagus. On the mucous membrane covering the varices were found no losses of substance which could have been the site of the hemorrhages. In no part of the portal system was any venous dilatation to be seen; no varices anywhere except those of the esophagus which seemed to develop immediately after the exit of the veins through the muscularis.

Diphtheritic Paralysis.

Preisz (*Deutsche Zeitschrift für Nervenheilkunde*, Vol. VI, Parts 1 and 2) details the results of a careful anatomical examination which he carried out on three cases of post-diphtheritic paralysis. In all three the clinical picture was very similar: Shortly after the subsidence of the diphtheritic process there occurred a paralysis of the palate, followed by a gradual development of a paralysis of the extremities; in one case ataxic symptoms. Death ensued because of an extension of the paralysis to the muscles of deglutition and of breathing. The microscopic examination revealed corresponding pathologic changes in all three cases alike in the medulla and in the peripheral nerves. The cells of the anterior cornua were partly atrophied, the gray substance the seat of small hemorrhages, and the posterior roots degenerated. In the case with ataxia there was a very marked degeneration of the posterior columns. In the affected peripheral nerves in many places the medullary sheath was totally gone and the nuclei increased; in other places the medullary sheath was swollen, degenerating, granular. In post-diphtheritic paralysis there is therefore a simultaneous disease of the entire nervous system, central as well as peripheral, the diphtheritic poison *via* the blood-vessels reaching the entire nervous system and being capable of affecting it in its entirety at one and the same time.

The Action of Glycerin on the Digestive Tract.

Aubeau (*La Pratique Médicale*, Nos. 13 and 14, 1895) details his experiences with the use of glycerin in various affections of the gastro-intestinal tract. He

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asserts that he has made use of the drug with unvarying success in acute diarrhea, infantile diarrhea, dysentery, and chronic diarrhea symptomatic of some gastro-intestinal affection. He found it particularly serviceable in the diarrhea affecting members of the French army corps in the colonies. He administered the chemically-pure glycerin in water or milk in daily doses varying from ten to thirty grains to an infant, and from eighty to one hundred grains to an adult. The daily dose should be given in four equal parts. Under the influence of glycerin the appetite improves, the digestion becomes more active, the diarrhea diminishes and finally ceases, and the patient's general health rapidly improves, the rapidity of improvement depending upon the duration and severity of the previous diarrhea. Borated glycerin 1 to 100 was often employed. In some of the more severe cases treatment supplementary to the glycerin was also made use of. In case of ulceration of the lower bowel he used rectal injections; in cases of great prostration he used daily injections of from five to ten grains of artificial serum (formula of Dr. Chréon: Phosphate of sodium, 8; sulphate of sodium, 4; chloride of sodium, 2; carbolic acid, 1; distilled water, 100). He ascribes the utmost utility to the glycerin, and asserts that it exercises a powerful modifying influence on the gastro-intestinal mucous membrane. Results of some bacteriologic investigations are given.

Multiple Pseudo-Melalotic Gas Abscesses of the Skin following Erysipelas.

Zeller and Arnold (*Virchow's Archiv*, Vol. cxxxix, Part 2). In a female patient, aged 22 years, following an attack of erysipelas, there occurred peculiar melanotic abscesses, as many as 650 during a year and a quarter. The abscesses, of various sizes, were limited to the cutis and subcutis, and were remarkable because of the formation of gas in the centre and because of the deep black color of the abscess-wall. The pus had an odor resembling that of fecal abscesses. An incomplete bacteriologic examination of the pus revealed the presence of streptococci and other indefinite cocci and bacilli. The histologic examination showed that the pigment affected the connective tissue and elastic fibres, the membrane of the fat-cells, the vessel-walls and contents of the latter, especially the red blood-corpuscles. These elements were partly diffusely discolored, partly laden with pigment granules, which contained considerable iron. The formation of the abscesses is explained on the supposition that following erysipelas embolic foci of hemorrhagic infarction and hematogenous pigment formation occurred, in which, under the development of gas, necrosis, pseudo-melanosis, later suppuration, took place. Following incision, the individual abscesses healed rapidly, leaving a white scar. During the course of the affection there was present fever to the extent of 104° F. and above. The patient's general health was but slightly affected. Complications on the part of the internal organs did not occur, and the patient made a complete recovery.

Idiopathic Rupture of the Heart.

Collings (*Lancet*, April 20, 1895) reports a case of a man, aged 53 years, who had always been of sedentary habits and troubled with dyspepsia and weak heart, but had never had rheumatism. The man began to feel out of sorts, and three days before his death his speech became thickened, but subsequently cleared up. During the course of that day and the following one he gradually developed a paralysis of the left side of the face, of his left arm, and left leg. On admission

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to the hospital the above-mentioned paralyses were found; sphincters were unaffected; there was no pain; heart-sounds faint; no murmurs. At about 11 A.M. the day following his admission he was moved to a water-bed, his body and head being kept horizontal, great care being taken to avoid any sudden movement. At 6.15 P.M. his pelvis was raised to permit of the introduction of a bed-pan. The man died almost instantly. At the post-mortem examination careful and prolonged search failed to reveal any macroscopic changes in the brain, its vessels, or the meninges. The pericardium was filled with blood-clot, which upon being washed away disclosed a laceration one and a half inches in length on the left lateral wall of the left ventricle. The aperture was closed by a recent clot. The cavities of the heart were dilated, the walls thin and in an advanced stage of fatty degeneration. There was no valvular disease. The aorta and its main branches were atheromatous.

WILLIAMS (*Medical Record*, May 18, 1895) reports the case of a woman, aged 50 years, the clinical history of which is incomplete, the principal complaint having been recurring anginoid pains. At the autopsy the pericardium was found to contain several ounces of clotted blood. The heart was of moderate size, subpericardial fat abundant, muscle thin, pale, and flabby. There was a rupture of the left ventricle twenty-five millimetres to the left of the right margin of the left ventricle, about midway between its apex and base. No valvular disease, aorta somewhat atheromatous, also the left coronary artery, especially the right branch. The progress of events seems to have been a thinning and an atrophy of that part of the cardiac wall supplied by the right branch of the left coronary artery; later a thrombosis of the artery and necrosis of the already thinned area, followed by rupture.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

ASSISTED BY

G. G. DAVIS, M.D., M.R.C.S., AND ELLWOOD R. KIRBY, M.D.

RESECTION OF THE RECTUM BY A NEW METHOD.

ROUTIER (*Bulletin et Mémoires de la Société de Chirurgie*, 1894, p. 646) describes the operation of Moulonguet for resection of the rectum. The coccyx is resected, as done by Kraske, with the patient on the right side, but the incision stops short of the anus three or four centimetres. The patient is then turned on the back and the lower part of the rectum dissected out, taking care not to remove the sphincter ani; this dissection is carried above the growth, which is removed by a transverse division of the bowel. The divided end of the intestine is then brought down within the anal sphincter, this maneuvre being accomplished by traction with a forceps introduced in the anus, and by the fingers introduced through the posterior incision. Care should be taken not to twist the bowel on its axis. Moulonguet's first operation was done in 1890 on a very extensive case, and death ensued from shock in fifteen hours. The second case was successful,

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and the patient had full control over his rectum. The growth in this case did not go beyond eight centimetres above the anus. Routier does not think that the operation is applicable to very high cancers, on account of the impossibility of bringing the divided end of the bowel down into the anus.

Treatment of Diffuse Peritonitis Resulting from Appendicitis.

McBurney (*Medical Record*, March 30, 1895) reports twenty-four operations in cases in which the protecting wall was either entirely absent or more or less incomplete. The following plan of treatment was adopted: The incision is large, from four to five inches, made as near to the anterior spine of the ilium and the outer part of Poupart's ligament as possible. After opening the peritoneum, every effort was made to remove at once with sponges all fluids in view. Then the appendix was sought for, removed, and the stump cauterized. The character of the case has, of course, by this time been appreciated, and the fact noted that either no adhesions have existed, or that they were imperfect, or, having existed, that they have given way and the abscess has ruptured into the peritoneal cavity. Search has then been made for further collections of fluids, the pelvis being usually examined first, unless this has been clearly walled off by adhesions. Rarely has he deliberately broken such wall, and only when tenderness at another point, or other sign, has led him to suspect secondary formations. In most cases the pelvis was found filled with a sero-purulent, often offensive, fluid. Cautious search was then made for similar accumulations in other cases, a small sponge on a handle being carefully pushed first in one direction then in another. When all purulent products have been sponged away, the washing with sterile salt solution, as hot as can be comfortably borne by the hand of the operator, is done. This solution is poured out of a pitcher or glass flask into the pelvis and then sponged out again. The same washing is done in the right loin, and then in any direction where septic fluid has been detected. The pelvis is then sponged dry and a glass drainage-tube introduced; a piece of gauze is placed in the tube and another slip usually passed close beside the tube and also to the bottom of the pelvis. If the loin is suspected, another slip of gauze is placed as far up as the kidney. If the general cavity towards the median line has been involved the packing is introduced in strips from three to six inches beyond the wound in various directions among the intestines. Finally, the wound surrounding the stump of the appendix has been widely packed with gauze,—no suturing of any kind is attempted,—over all a large mass of dry sterilized gauze and cotton is bound with a firm broad roller. Half an ounce to an ounce of whiskey is administered by enema, and a hypodermic of morphine and atropine given. Nutrient and stimulant enemata are sufficient for one or two days.

The number of cases given is twenty-four, of which fourteen recovered and ten died. Besides these, quite a number of others were brought to him for operation, or he was called to them, which were in too hopeless a condition to justify interference.

Epithelioma of the Tongue.

Puzey (*Lancet*, April 6, 1895) reports two cases of epithelioma of the tongue. In one the left lateral half was removed, and in the other the right lateral half. No glands were removed. The whole period of the healing of the wounds in both cases was passed without the presence of any fetor. This is attributed to the hourly painting of the whole wound with glycerin and borax.

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The Radical Treatment of Lupus.

R. T. Cesar (*Lancet*, April 6, 1895) refers to Mr. Bidwell's report of six cases in the *Lancet* of July 21, 1894, and to his statement that Mr. Watson Cheyne is credited with being the first to operate on lupus by excision and skin-grafting. The writer states that twenty years ago he operated on a man, aged 62 years, with lupus of the face; it was "much larger than a half-crown piece." He made a deep incision all around the edges, and then dissected up the floor of the ulcer entire. Dry antiseptic dressing was applied and a permanent cure resulted.

Ten years ago he treated a lupoid ulcer two and a half by one and a half inches in extent, on the cheek of a boy, aged eight years, in the same manner. He thinks this treatment better than curetting, and he does not regard skin-grafting as essential.

A Case of Incarcerated Hernia and its Reduction by Rectal Taxis.

Brown (*Medical News*, May 4, 1895) gives the case of a child, aged 2 months, suffering from strangulated hernia in the right inguinal region. He attempted reduction by inversion of the child and taxis under chloroform. Although this was continued for half an hour, it failed. The index-finger of the right hand was then introduced into the rectum, and while steady pressure was made on the mass from without with the left hand, with the finger in the bowel he pushed the portion of the mass presenting through the abdominal opening from side to side in every direction.

By this means the mass was finally moved slowly back through the opening, and finally dropped into the abdomen. The tip of the finger could then be inserted into the internal opening. He suggests that in adults, if the surgeon possess a small hand, it may be introduced into the rectum and traction made with the finger and thumb on that portion of the tumor just within the abdominal ring.

Case of Resection of Intestine with Approximation by means of Murphy's Button.

Bush (*Lancet*, April 6, 1895) reports the case of a man, aged 55 years, who came under his care for strangulated hernia. The patient was collapsed and had stercoraceous vomiting. Herniotomy was performed and four inches of the gut found included; it was quite black. A second incision about three inches long was then made in the median line of the abdomen midway between the umbilicus and the pubes, and the strangulated portion of the gut brought out there. Intestinal clamps were applied and the gangrenous intestine removed with scissors; some vessels of the mesentery were ligated but no wedge-shaped piece was removed. The largest size of Murphy's small intestine buttons was then inserted but no sutures were used to unite either the divided intestine or mesentery. As the patient was in shock no attempt at radical cure was made, but the scrotal sac was only drained and the wound closed. On the next day the abdomen was distended, but on the day following considerable flatus passed, and three days later there was a slight action of the bowels. The writer calls attention to the quickness of operating by means of the button, and suggests making the expanded part of the button of decalcified bone, thus enabling a larger size to be used. The button was passed, without any purgatives having been given, five weeks after the operation.

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Epitheliomas of the Skin of the Face.

Lagoutte (*Lyon Médical*, December, 1894, p. 575) concludes his study on epithelioma of the face as follows:

(1) One should distinguish between the epitheliomas of the skin of the face and those of the mucous border of the lip in particular.

(2) The latter develop usually during the second half of life and most often in peasants. In both cases heredity does not appear to exert much influence.

(3) While epithelioma of the lips shows a marked predilection for the male sex (69 women to 527 men), that of the skin shows an equal frequency in the two sexes.

(4) Frequently these growths develop on an anterior lesion, whether congenital, as a nevus, or acquired, as cicatrices, lupus, etc.

(5) They are of three kinds, (*a*) rapid in progress, soon involving the glands; (*b*) superficial, of slow progress; (*c*) intermediate forms, but the largest number resemble the latter.

(6) Their gravity varies with their locality. Those at the junction of the mucous membranes are the most malignant, while those of the nose and cheek are more benign.

(7) The mode of evolution influences their growth. Those which grow from moles are apt to become melanotic. Those developing from lupus are very rapid in their progress.

(8) Sometimes ulcerations possessing the appearance of epithelioma are found on microscopic examination to show simple inflammatory tissue or to be of a tuberculous nature.

(9) In the large majority of cases the growths may be classed as (*a*) epithelioma with cell-nests and (*b*) tubular epithelioma. The former mostly affect the lips; the latter the skin of the face and are usually more benign.

(10) The author agrees with Bard, that the lobular or nest type of epithelioma springs from the Malpighian bodies, while the tubular type springs from the sudoriparous and sebaceous glands.

(11) The treatment varies as to the growths being superficial or deep. The former are curable by many applications, as potassium chlorate, resorcin, aniline colors, etc. This probably results from their antiseptic action. If these fail, then do not resort to caustics, but employ the cutting curette or the knife. In the grave cases the ablation should be extensive, with removal of the glands. If it is impossible to remove the disease thoroughly the treatment should be palliative.

Radical Cure of Hernia.

Beresowsky (*Zeitschrift für Chirurgie*, 1895) gives an elaborate report of the operations for the radical cure of hernia as performed by Kocher in the Berne clinic. He submits the following conclusions:

(1) That in view of the absolute lack of mortality, and only a small percentage of return, the expressed wish of the patient is a sufficient indication for operating.

(2) That the size and duration of the hernia decreases the chances of success, both as regards healing and freedom from return.

(3) The age of the patient has but little influence on healing and only increases the probability of a return of the hernia.

(4) In children, the wound should be as hermetically sealed as possible, the sutures being placed close together, and no drainage used. Collodion dressing is to be applied.

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(5) Kocher's method gives results in no way inferior to those of Macewen and Bassini, and by being much simpler is less liable to disturbance in healing.

(6) Enlargement of the veins should be treated by their removal.

(7) The subsequent use of a truss is regarded as unnecessary.

On the Results of Excision of the Knee-Joint.

Jonathan Hutchinson (*Archives of Surgery*, April, 1895, p. 97), in writing on excision of the knee, makes use of these words: "Excision of the knee-joint has, I believe, with many surgeons fallen into almost complete disuse."

He had four cases in private practice. Of these one died of tetanus, but the other three recovered with firm anchylosis. He states that this is the complete record of his private cases; and he offers it as a valedictory contribution, for it is thirteen years since his last case, and he states that it is not likely he will ever do another; nor, perhaps, is it probable that complete excisions of this joint will ever again come into professional favor. It may serve, at any rate, to counteract any future tendency to speak depreciatingly of the final results of complete excision of the knee.

THERAPEUTICS.

UNDER THE CHARGE OF

HORATIO C. WOOD, M.D., LL.D., AND ARTHUR A. STEVENS, M.D.

The Serum Treatment of Diphtheria.

Mya (*Lo Sperimentale*, February 21, 1895, and *British Medical Journal*, April 20, 1895) discusses some of the drawbacks to the serum treatment. Cutaneous manifestations have been unanimously attributed to the treatment; they have rarely been hemorrhagic; there is occasionally general disturbance. A very few cases of articular complications have been noted, which pursued an acute course, but were not serious. Some have attributed, with apparently insufficient reason, renal, cardiac, and nervous complications to the serum. The author's observations extend to over fifty cases, and the inconveniences caused by the treatment have been insignificant. In four cases there was a scarlatiniform eruption. The resemblance in one case to scarlet fever led to the isolation of the patient, but the subsequent course showed the true nature of the case. A rapid and evanescent urticaria was seen in two cases. Sometimes the temperature was raised and a general disturbance was noted. This, of course, is no contra-indication to the treatment. Most authors have attributed the eruptions to the horse serum. The serum does not possess any demonstrable action upon the red blood-cells. The author would attribute the cutaneous manifestations to a vaso-motor change, or to an alteration in the lymphatic circulation. Fever must be due to exaggerated personal susceptibility. The dose has no effect in producing the cutaneous complications. The author does not think it possible to attribute either albuminuria or the myo-cardial and nervous manifestations to the serum. Among the fifty cases there was diphtheritic paralysis in four or five cases, and in one sudden death from cardiac complications; but in days before the serum treatment the author

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saw more cases of this kind. He concludes that the serum should be used early and abundantly in severe cases. It must be recognized that since the introduction of the serum treatment cases hitherto looked upon as beyond help have recovered, especially has this been true of infants.

Santucci and Mucci (*Lo Sperimentale*, February 11, 1895) first remark upon the technique of tracheotomy. They have treated thirteen cases with serum supplied by Roux and Behring. The diagnosis was confirmed bacteriologically in six cases. The cases were all injected, except one, immediately after admission. In only two cases was urticaria noted. Among thirteen, three died, representing a mortality of 23 per cent., whereas in seven cases otherwise treated during the same period four died. The authors think that the results speak in favor of the serum treatment. They are also of the opinion that tracheotomy increases the gravity of the case by opening the way to the absorption of infective products, but intubation is only practised in Mya's clinic in infants under 1 year of age, in whom recovery after tracheotomy has not been recorded.

Silva (*Gaz. d. Osped.*, March 2, 1895) has treated seventeen cases with Behring's serum, details of which are given. The youngest patient was 10 months, the eldest 15 years old. Bacteriological examination was made in fifteen cases, and in fourteen Lœffler's bacillus was found. Of the seventeen cases, three died, but one of these was obviously not diphtheria, and, perhaps, another should also be included; the mortality would then be 7.14 per cent. Among the recoveries were some very severe cases with complications. In six cases there were symptoms of laryngeal stenosis. Sometimes the serum was injected into the veins, and then half the quantity only was used. No signs of local irritation were produced. Enlargement of the submaxillary glands was noted, and the membrane began to detach itself spontaneously. Where albuminuria or nephritis was present the serum did not aggravate it. The general condition of the patient was improved. Recovery soon took place after the injection,—in from five to eleven days. Paralysis was twice seen. There was a suppurative parotitis in one case. The author concludes that the results of the treatment were satisfactory.

The Use of Hydrochloric Acid in Gastric Affections.

Huchard (*Journal des Praticiens*, No. 7, 1895) considers hydrochloric acid of value in gastric affections, both as an antiseptic and as an eupeptic. It is useful in all conditions of the stomach in which the hydrochloric acid is diminished or absent. In those cases it renders the pepsin potent, which without the acid would be inert. The remedy is indicated in delayed digestion, subacidity, chronic gastric catarrh, cancer of the stomach, in febrile disease, which always produce subacidity, in pulmonary phthisis, in cardiac disease when compensation fails, in anemia, especially chlorosis, and in certain nervous affections, such as neurasthenia.

It is contra-indicated in hyperacidity, gastro-succorrhea, peptic ulcer, cancer secondary to peptic ulcer, acute gastritis, and in dyspepsias in the hysteric and neuropathic.

It should be given for three or four weeks, discontinued for a couple of weeks, and then renewed. The author believes that the large doses recommended by Ewald—fifteen drops three or four times after meals—should be avoided. As antiseptic it checks fermentation and the production of fatty acids, and is therefore of distinct value in dilatation of the stomach, certain types of gastric cancer, and in all conditions in which fermentation and pyrosis are prominent symptoms. As an

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antiferment it should be given some hours after meals; as an eupeptic during and after meals. When the double action is required, one dose may be given immediately after the meals, and another three or four hours later.

Assafetida in Obstetrical and Gynecological Practice.

Warman (*Therapeutische Monatsheft*, January, 1895) lays stress on the insufficiency of the remedies hitherto recommended in cases of abortion, pointing out that small doses of opium frequently disappoint, whereas large and repeated doses may prove injurious, and of very little value with patients subject to the habit of aborting. The author was therefore readily disposed to employ assafetida, as first recommended by Italian obstetricians. It was usually administered in pills containing one and a half grains, though an enema containing the tincture was soon preferred in cases of threatening abortion. The author found the drug most efficacious in reducing the hemorrhage, which is prone to appear subsequently. Even with a very severe and alarming onset the first dose appeared to exert a most tranquillizing effect, and led to a gradual separation of the ovum unattended by contractions. Several instances are described to illustrate this, but the material at the author's command is insufficient to warrant him in ascribing to assafetida prophylactic properties. It is otherwise where habitual abortion has existed, and a successful issue in a most obstinate case is described, five in all having been observed by the author. To these patients the pills are administered, commencing with two *per diem*, and increasing to ten, the number subsequently being again reduced. No unpleasant symptoms were produced, but, on the other hand, the action of the bowels was very much assisted, to which the author ascribes much of the success in those cases of what he terms "*abortio habitualis.*"

The Treatment of Malignant Tumors by the Toxines of the Streptococcus of Erysipelas.

At a meeting of the American Medical Association, held in Baltimore, Md., May 7 to 10, 1895, Dr. Senn, of Chicago, in a paper on the above subject, stated that the treatment had proved unsuccessful in all the cases in which he had tried it. In many of the cases reported as successfully treated by the toxines, the diagnosis of the tumors had not been verified by clinical or microscopic examination. In nine cases he had used from twenty-five to seventy-five injections, of from three to fifteen minims, the toxines being derived from three different sources. He not only failed to effect a cure, but in some instances the condition seemed to be aggravated by the injections. He resorted to the treatment only in inoperable cases.

In the discussion of the paper, Dr. Coley stated that he had treated eighty-four cases during the past four years. They were all malignant: forty-three sarcomas and twenty-seven carcinomas. Eleven sarcomas and two carcinomas were cured. Three of the cures, at present, were of two years' standing, with no symptoms of recurrence. Until the present, he had advocated the use of the toxine in nothing but sarcoma.

Dr. Fenger, of Chicago, had used the remedy in twelve cases without benefit.

Dr. Wyeth, of New York, suggested that the injections might do good through their inflammatory action, destroying the rank cells of the tumor.

Dr. Herring had seen an attack of erysipelas aggravate a large malignant growth upon which he had operated unsuccessfully.

Dr. Keen stated that the remedy had failed in his hands in sarcoma and carcinoma, except possibly in one instance.

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OBSTETRICS.

UNDER THE CHARGE OF

BARTON COOKE HIRST, M.D.,

ASSISTED BY

RICHARD C. NORRIS, M.D., AND FRANK W. TALLEY, M.D.

DELIVERY IN CERTAIN CASES OF IMPACTION OF THE TRUNK OF THE FETUS.

HERBERT R. SPENCER (*British Medical Journal*, April 13, 1895) refers to those cases of head presentation in which it is found, after delivery of the head, that the child's body will not pass through the pelvis without reducing its size. It is sometimes impossible to deliver the child's body unmutilated, especially if the pelvis be contracted. The difficulty may be due to the large size of the child, apart from the rare cases of double monster and of tumors external to the child's trunk. The largest child Spencer had ever seen weighed thirteen and a half pounds and required mutilation on account of its great size. A child of half this weight may be unable to pass through a small pelvis. In normal pelvis the obstruction formed by the child's trunk may be due to pathological conditions either in the serous cavities or in the viscera. A diseased enlargement of the thorax of any considerable extent is very rare.

A slight serous or bloody effusion into the pleura is very common, and Spencer has once met with acute pericarditis in a new-born child, an enlargement of the thorax from these causes, sufficient to cause obstruction in labor, is very rare. One of the most common causes of obstruction is distention of the child's abdomen with gases of putrefaction. It is a good rule to always percuss the uterine tumor in cases of obstructed labor. Another frequent source of distention is ascites or peritonitis. Spencer has seen the vagina distended sufficiently to form an abdominal tumor, and great distention of the bladder and uterus have been met with by other observers. The only other causes of distention he has personally met with are,—distention of the colon by meconium in imperforate anus, cystic kidneys, hydronephrosis, distended ureters, and enlargement of the liver and spleen in syphilitic children. Traction on the child's head in order to deliver the trunk should be made only with great care and judgment; the employment of great force has frequently caused rupture of the uterus. If judicious traction fail to bring down the trunk it may be necessary to reduce the width of the child's shoulders. With this object in view Spencer has found it a useful plan to snip through the clavicles with scissors, then, if necessary, to pass a blunt hook into the axilla and thus bring down the arms. If delivery is still impossible, it may be necessary to remove the head in order to gain room for further manipulation. Before decapitating it is advisable to seize the neck with a strong vulsellum furnished with interlocking teeth which will prevent the trunk from receding out of reach. There is usually little advantage to be gained by opening the thorax and the broken ribs are troublesome. The hand should be passed up to the abdomen, which should be opened with the scissors or the perforator. If the obstruction be due to gas or liquid effusion the obstruction is immediately relieved and the delivery effected. In other cases it may be necessary to remove the abdominal viscera. In transverse presentations version can usually be performed, and if there is impaction it is rare that decapitation cannot be effected. Twice Spencer has met with cases in which neither operation was possible. In both the pelvis was contracted and the

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soft parts edematous, and one was complicated by placenta previa. The uterus was retracted and hard, the back of the child presenting, it was impossible to introduce the hand for decapitation or turning. The method successfully used in these cases was as follows: An incision was made through the skin of the child's back and the spine cut through with scissors. Braxton Hick's cephalotribe was then applied to the sides of the trunk of the child and the instrument screwed up. By traction the soft parts were drawn down and then cut through with scissors. The delivery of the two halves of the child's body presented then no difficulty.

Hydrorrhea Gravidarum.

Chazan (*Centralblatt für Gynäkologie*, February 3, 1894) indicates three main sources for the fluid which escapes from the uterus during pregnancy; the uterine wall, the space between the fetal membranes, and the sac of the amnion. Edematous infiltration of the uterine wall has also been spoken of by older writers as a cause of hydrorrhea; we possess, however, no precise knowledge of this form. Decidual hydrorrhea, on the other hand, is supported by clinical experience and anatomical facts, although there are many unsettled points about it. Hennig and Schröder believe that the fluid collects between the chorion and the decidua, while Kaltenbach and others consider that it lies between the opposed surfaces of the decidua vera and reflexa. The fact that the escape of fluid often begins in the third to fourth month, at a time when, under normal conditions, the two deciduæ have not united, supports the view of Kaltenbach. In the early period of pregnancy a space is found to exist between the decidua vera and the decidua reflexa, which ordinarily only contains a little mucus, but which might become distended with fluid by hypersecretion from the decidua, or by hemorrhage. In recorded cases there has been no direct evidence produced that union had not taken place between the decidua vera and the decidua reflexa; but it seems to be the probable explanation of the fact that the greatly thickened vera has been sometimes separately expelled after the placenta.

As to the nature of the pathological process which causes decidual hydrorrhea we are still in the dark. Braun emphasizes the existence of previous endometritis with exudation. Hegar considers the morbid process to be of the nature of hypertrophy of the decidua, especially of its glands. Scanzoni believes it to be due to transudation dependent upon the condition of the blood. Fini regards the fluid as an extravasation resulting from the hyperemia and increased vascularity of the uterine mucosa. Chazan is inclined to refer it to the periodic congestion of the genital organs, which occurs during pregnancy, and induces molimina, liability to abortion, etc. It is well known that in many instances the amnion and chorion, instead of being glued together by an amorphous tissue. are separated by a collection of fluid so that two sacs are present in the after-birth. It may be that these so-called fore-waters can escape during pregnancy, and thus explain some cases of hydrorrhea; but this cannot be proved because we know no sign by which these waters may be distinguished. Döderlein has proved that in a case observed by him the fore-waters could not be chemically distinguished from the liquor amnii. Dugès and Jörg indicate the allantois as a possible source of the fluid in hydrorrhea.

That form of hydrorrhea still remains, in which the liquor amnii escapes during pregnancy. Chazan records the case of a primipara, aged 23 years, who consulted him when five months pregnant for thirst, weakness, and breathlessness. He diagnosed hydramnion from the large size of the uterus. About the end of the sixth month labor-pains set in and abortion seemed about to occur. After the

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pains had lasted for some hours a large quantity of watery fluid escaped, and the pains then gradually ceased. Fourteen days later a second escape of fluid occurred preceded by pains of a similar character to the first. The patient then went to term without any further loss of fluid. A normal labor occurred, the child being strong and well developed. The after-birth was carefully examined.

The chorion was found to be separated from the amnion over a wide area; besides the opening through which the fetus had passed, a second aperture, as large as a dime, with slightly thickened edges, was found in the amnion in the separated area.

Antiseptics in Midwifery.

Professor Tarnier, late surgeon to the Maternity at Paris (*Practitioner*, March, 1895), recommends the following plan: The hands are washed and scrubbed with a nail-brush in a solution of 1 : 4000 perchloride of mercury, soap being used. The depression around the nails is cleansed with a wet cloth, the hands washed in alcohol to remove the fatty substances and steeped in a perchloride solution. A vaginal douche of perchloride of mercury is given before and after delivery, and the greatest care is exercised in cleansing the vulva. At the termination of labor an intra-uterine douche of iodine and water is given in all cases, the following formula being the one employed:

℞ Tincturæ iodi. . . . . f℥i.
Potasii iodidi. . . . . ʒiss.
Aquæ destillatæ . . . . . f℥xxxii.
Ft. lotio.

Instruments are sterilized in a specially devised dry-heat sterilizer. The following solution, known as Van Swieten's fluid, is employed:

℞ Hydrargyri perchloridi . . . . gr. xv.
Alcoholis . . . . . fʒiii.
Aquæ destillatæ, q.s. . . . . oii. M.

This lotion is diluted with four times its bulk of water before use, so that its strength then becomes 1 to 5000. Professor Tarnier believes that this is less toxic than mercurial solutions made with tartaric acid.

GYNECOLOGY.

UNDER THE CHARGE OF

CHARLES BINGHAM PENROSE, M.D.,

ASSISTED BY

WILLIAM A. CAREY, M.D., AND H. D. BEYEA, M.D.

Uretero-Cystotomy Seven Weeks after Vaginal Hysterectomy.

Kelly (*Bulletin of the Johns Hopkins Hospital*, Vol. vi, No. 7) reports the history of a case of ureteral fistula which developed as a sequel to vaginal hysterectomy. The original operation required an extensive dissection, as the carci-

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nomatous degeneration of the cervix uteri invaded the surrounding tissues for a considerable distance. The ligatures were consequently placed at a greater distance than usual from the cervix uteri, and in placing them on the right side the ureter of that side was occluded. The cystoscopic examination of the patient showed that the right ureter was obstructed; the left one was free. Operation for the relief of this condition was undertaken seven weeks after the removal of the uterus. The end of the ureter could not be found on the pelvic floor on account of the rigidity and inflammation surrounding the line of scar-tissue between the rectum and bladder. The right ovary and tube were also bound down to this scar-tissue by numerous adhesions. Failing to locate the ureter at this point celiotomy was performed, when it was sought and readily found at the pelvic brim, after lifting up the caput coli and incising the peritoneum and pushing aside the fat.

It was then traced from the point of crossing the common iliac artery down to the pelvic floor, exposing the whole length of the pelvic portion by splitting the peritoneum over its surface. The anterior part of the ureter was involved in the inflammatory material surrounding the scar, which bled so freely that an attempt to dissect it out had to be abandoned. Finally, four cubic centimetres of the tube lying directly posterior to the scar-tissue were separated from its inflammatory bed, and divided close to the scar so as to sacrifice as little of it as possible. It was found, however, that there was not enough available for union with the bladder except by making too much traction, and in order to avoid this, as the stitches would not hold under traction, the bladder was dissected free from its attachment to the horizontal rami of the pubis and allowed to drop back into the pelvis.

In this manner the ureter and bladder were approximated without strain, and a small incision was made through the peritoneal coat of the bladder just large enough to receive the ureter snugly. The under surface of the ureter was then trimmed and the union to the bladder was effected by holding the ureter temporarily by a long pair of forceps introduced through the urethra, the bladder, and the incision, while six silk sutures were introduced through the muscular tissue of the bladder and the peritoneal and muscular coats of the ureter, beginning with the under side. The union was perfect and a provisional gauze drain was removed from the abdomen and the abdominal wall closed entirely after the second day. At a subsequent cystoscopic examination the newly-made ureteral orifice was found opening into the posterior hemisphere of the bladder into which it freely discharged its urine.

In connection with the above history the following abstracts from the *British Medical Journal*, May 11, 1895, are of interest:

RICHELOT (*Gazette Médicale de Paris*, April 20, 1895) has observed the development of small vaginal fistulæ a week or ten days after hysterectomy. They coincide with the separation of the eschars. They are generally supposed to be due to wounds of the ureter, but Richelot thinks it more probable that they are the result of damage to the base of the bladder. Recent discussion by French surgeons developed the fact that in vaginal hysterectomy the right ureter is more frequently injured than the left. An explanation of the manner in which this accident happens is given by Fournel (*Gazette des Hôpitaux*, April 23, 1895), who believes that the right forefinger can, with little difficulty, thoroughly separate the tissue on the left side of the cervix while the uterus is drawn down by the left hand holding the volsella; but it cannot so easily separate the cervix from the structures on the opposite side. The left hand, when grasping the volsella firmly so as to draw the uterus well down, tends to be supinated, and in that position it draws the uterus easily towards the right side of the patient; hence it is easy to

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separate the tissues to the left of the cervix working with the right forefinger, since the left hand does not readily get fatigued; but to let the right forefinger work in the right side of the uterus, the left hand has to be pronated, depressed towards the patient's perineum and swing to the patient's left side. Under these unfavorable conditions it is not possible to do such careful clearing away of structures and the right ureter is consequently in danger when the ligatures are applied. To avoid this accident it would be well to allow a trusty assistant to hold the volsella while the operator clears the cervix on the right side with his own right forefinger.

Myomectomy during Pregnancy.

Rosenberg (*American Journal of Obstetrics*, May, 1895) records four cases of pregnancy complicated by fibroid tumors of the uterus. The tumors varied in size in different cases from an orange to a fetal head. The plan of procedure was to allow pregnancy to progress without any interruption unless indications should arise for some action. No need for this arose, and each case was successfully delivered and passed through a normal puerperium.

The only complication that presented itself was adherent placenta with postpartum hemorrhage in two cases. The tumors decreased rapidly after delivery in each case, and Rosenberg contends, in view of this experience, that myomectomy, which is a dangerous operation, should never be performed during pregnancy unless some exigency arises. Such cases, he thinks, will be very few. Most cases requiring operation can be allowed to go on till labor begins, and then if delivery *per vias naturales* is impossible, then, and only then, has the time arrived to interfere and to perform the sectio Cesarea or Porro operation. Both of these operations give far better results than myomectomy during pregnancy, especially if timely preparations have been made.

Finally, he thinks that too many such operations are being performed for insignificant indications, and that fibroids, except when they are very large, do not give rise during pregnancy to so many alarming complications as we have been led to believe.

Ventrofixation of the Uterus.

Foerster (*American Journal of Obstetrics*, May, 1895) describes a new method of fixing the retrodisplaced or prolapsed uterus by operation through the vagina. After the usual preparatory treatment the patient is placed in the lithotomy position with the pelvis elevated, in order to throw the intestines high in the abdomen. The bladder is emptied and the uterus curetted. After this is done, Douglas's pouch is opened, and a finger is introduced to break up any adhesions which may exist. A sound is then introduced into the uterus, and under its pressure with the assistance from the finger in Douglas's pouch the body of the uterus is brought down into the vagina and out of the vulvar orifice. If necessary to remove the adnexa, it can readily be done at this stage of the operation. The anterior surface of the fundus uteri is then scarified and transfixed by two silk threads. The uterus is now pushed back through the vaginal incision, the four ends of the sutures hanging through the vagina. By means of a specially-constructed needle, consisting of a canula with a blunt point, in which by a proper mechanism a needle can be carried to and fro, each end of the sutures is brought, by the guidance of the fingers inserted in the vaginal opening, to the abdominal wall. After being certain that neither intestine nor bladder is in the way, the

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blunt end of the canula is pressed against the peritoneum and the secreted needle is pushed through the abdominal wall. The silk thread is then taken out of the eye and the needle is drawn back into the canula and removed. The three remaining sutures are applied in the same manner, and the ends are tied together on the abdomen over a compress of gauze, while the uterus is pushed forward by the fingers in the vaginal incision. An aseptic dressing over the abdomen and closure of the vaginal incision, except a slight opening for drainage, complete the operation. While Foerster has not yet had a large number of cases treated after this method, he claims to have had sufficient experience with it to warrant the following claims in its favor: The absence of shock, as in all vaginal operations; the fact that the consent of the patient can more readily be gained for an operation through the vagina than through the abdomen; that ventral hernia is out of the question, as are likewise adhesions of the intestines or omentum to the abdominal cicatrix; natural drainage is established by the opening in Douglas's pouch; that the uterus is brought to a higher plane than is possible to attain in vaginal fixation.

Supernumerary Ovaries.

Ruppolt (*Archiv für Gynäkologie*, Band xlvii, Heft 3) describes the following case of supernumerary ovary which came under his notice in the Prochownick Clinic. The patient was operated upon because of a tumor in the right ovarian region the size of an apple, severe pain in the lower abdomen, retroflexed uterus, and laceration of the perineum. The right tube was found constricted in two places by old omental adhesions. Upon the uterine side of the constrictions was an atrophied ovary, and upon the abdominal side, beyond the abdominal ostium, was a dermoid cyst the size of an apple. Microscopic examination of the ovary and ovarian tumor showed them both to contain undoubted ovarian tissue. Similar cases have been reported by Winckel and Sippel. Ruppolt believes that these and other cases observed permit the conclusion that a complete division of both the tube and ovary can take place as the result of a peritoneal inflammatory process, with or without torsion of the ovary, during intra-uterine life.

DERMATOLOGY.

UNDER THE CHARGE OF

LOUIS A. DUHRING, M.D.,

ASSISTED BY

M. B. HARTZELL, M.D.

The Treatment of Favus by Heat.

Having observed in culture experiments that the fungus of favus is very sensitive to high temperatures, Zinnser (*Archiv für Dermatologie und Syphilis*, Band xxix, Heft 1) has employed heat in the treatment of favus. The method of applying the heat was as follows: The scalp was covered with a compress wet with sublimate solution, 2 : 1000, and upon this was placed a series of Leiter's tubes through which water, at a temperature of 60° to 65° C., was allowed to flow. This

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application was made daily for twelve hours at a time during eight days; the treatment was then suspended and the patient's scalp examined from time to time to ascertain whether there was a reappearance of the fungus which had entirely disappeared. In three out of four cases treated in this manner a complete cure was obtained.

Congenital Exfoliation of the Skin. (Keratolysis Exfoliativa.)

Sangster reports the following case (*British Journal of Dermatology*, February, 1895). The patient was a man 24 years of age, and the skin affection was first noticed at the third week after birth, the forehead showing signs of desquamation. At the end of the third year the condition had become generalized, and had continued until the present time. It was stated by the father that the skin was always diseased but that the patient was subject to "attacks" three or four times a year, at which times the condition became aggravated. The skin was of a dusky hue and presented the following characters: (1) Extensive tracts of harsh epidermis, much of it thickened and divided into quadrate areas. Where not thickened the skin felt brittle and paper-like. On picking up the partly-detached margin of the epidermis it could be peeled up in sheets three or four inches square. The surface beneath was grayish-white, smooth, soft, and without any appearance of protruding papillæ; to the touch there was slight stickiness. After some hours the denuded surface became hyperemic, and even of a brilliant red color, and smarting of the part occurred; after some time the redness disappeared and the epidermis became firm. (2) Areas where the spontaneous exfoliation was taking place. The surface here presented a broken-up, ragged appearance, made up of tags of partly-detached epidermis, flake-like, papery scales with the edges turned up, and intervening denuded skin looking red and inflamed. The face presented a somewhat different appearance, being red and shiny. The palms and soles were the only regions not exfoliating, but the epidermis was thickened, sodden, and bathed in sweat. The parts most affected were the back, abdomen, buttocks, outside of the thighs; the scalp and glans penis also showed desquamation. The hair and nails were not altered.

The Production of Hypertrichosis by Local Applications.

Payne reports (*British Journal of Dermatology*, March, 1895) the case of a boy, 7 years old, with a patch of lupus upon the cheek and another upon the outer side of the left leg, in which the local treatment consisted in the prolonged application of a solution of bichloride of mercury. As a secondary effect of this treatment the growth of hair upon the leg was remarkably stimulated, the limb becoming covered with a thick growth of hair, in some parts being from a quarter of an inch to an inch in length. The author thinks there can be no doubt that the growth of hair was due to the application of the mercury. The author also expresses the opinion that the continued use of sulphur to the face for the cure of acne has some tendency to produce hypertrichosis.

A Case of Mycosis Fungoides.

At the *séance* of March 14, 1895 (*Annales de Dermatologie et de Syphiligraphie*, No. 3, 1895) Leredde presented a case of mycosis fungoides in which, after a short erythrodermic phase the lesions appeared upon the lower extremities under the form of small confluent tumors which disappeared within a year. For

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the last five or six months the patient complained much of urticaria, the lesions appearing during the night and diminishing in the morning. This eruption was very rebellious to treatment. More recently the urticarial lesions showed a tendency to persist, some of them being large and hard. These the author regarded as new mycotic lesions. Although the skin appeared to the naked eye but little changed microscopical examination showed considerable alterations, the most characteristic being the presence of numerous "mast-cells," which the author believes play an important *rôle* in the disease. Leredde believes that in the skin which appears normal alterations may be discovered with the microscope some time before they are evident clinically.

Paget's Disease.

Lindt (*Inaugural Dissertation*, Berne, 1895) reports a case of Paget's disease, and reviews at some length the literature of the subject. As the result of the microscopical examination of his case he is of the opinion that the large, double-contoured cells which are regarded as psorospermiæ by Darier and others, are not parasitic but degenerated epithelial cells.

Lichen Planus, with Pemphigus Supervening under Arsenical Treatment.

At a meeting of the Dermatological Society of London, held December 12, 1894, Colcott Fox (*British Journal of Dermatology*, January, 1895) exhibited a case of lichen planus in which pemphigus appeared during the administration of arsenic. The patient, a woman 26 years of age, had a generalized lichen planus accompanied by intense itching and burning. She was given five minims of liquor arsenicalis with a quinine and iron mixture three times daily. The arsenic was gradually increased to eight minims three times daily. About six weeks later she became ill and a crop of perfect pemphigus bullæ of all sizes up to a pigeon's egg appeared on the chin, forearms, and the nose. The tongue was coated, and there were pains in the arms, wrists, and elbows together with marked cramps in the fingers. The arsenic was continued and the bullæ appeared in still greater numbers, some occurring in the mouth.

The So-called Plasma Cells.

After an elaborate examination of many normal and pathological tissues, Marschalko concludes that Unna's views concerning these cells are incorrect; he rejects likewise the name plasma cells and proposes the term "krumel" cells. He finds no proof for the view held by Unna that these cells originate from the fixed connective-tissue cells, but, on the contrary, holds that he has produced proof that they are developed from the lymphocytes.

A Case of Undescribed Papulo-Ulcerative, Follicular, Hyphomycetic Disease of the Skin.

Under this title Duhring and Hartzell report (*American Journal of the Medical Sciences*, March, 1895) an undescribed form of mycosis of the skin. The patient was a boy, 15 years of age, employed in a mill. Upon the sides of the neck were patches of chronically inflamed, papulo-ulcerative, slightly crusted lesions. The

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disease, which had existed for three years, had produced slight whitish, pitted, irregularly-shaped scars. It resembled a mild expression of lupus vulgaris verrucosus more than any other malady. There was no resemblance to tinea circinata nor to tinea sycosis. A microscopical examination of several of the excised lesions disclosed the presence of spores and mycelium resembling in a general way the trichophyton fungus, except that they were much larger. The fungus was found in cavities occupying the site of hair-follicles.

Parasite of Molluscum Contagiosum.

K. Touton's (*Transactions of the Fourth German Dermatological Congress*, 1894) recent observations led him to the same conclusions that he arrived at before, —namely, that the parasite of this disease is a single-celled animal organism, probably a coccidium belonging to the class sporozoa.

Case of Symmetrical Cutaneous Atrophy of the Extremities.

E. B. Bronson (*Journal of Cutaneous and Genito-Urinary Diseases*, January, 1895) figures, with a good chromolithograph, a remarkable case, illustrating a very rare form of atrophy of the skin. It corresponds closely to Buchwald's well-known case, figured in the *Vierteljähreschrift für Dermatologie und Syphilis*, in 1883. In Bronson's case the skin was thinned and shrunken, and darker than normal in color. The veins were conspicuous, stood out, and were corded. The skin was much wrinkled, and in places was thrown up into folds, as in ichthyosis; these were diversified with smooth brownish or whitish interspaces with a glazed surface, resembling a dusky-colored crumpled sheet of waxed paper or gold-beater's skin. The man was aged 45, and the disease began fourteen years before.

MISCELLANEOUS.

CEPHALIC TETANUS—ERRATUM.

The twenty-fifth line on page 656, of the June number, "Taf (XIII, 1, 2, 3) demonstrates," etc., should read "Taf XIII, 1, 2, 3 demonstrate," etc., and should be a continuation of the previous paragraph.

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UNIVERSITY
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AUGUST, 1895.

ADDRESS TO THE GRADUATING CLASS OF THE MEDICAL DEPARTMENT, UNIVERSITY OF PENNSYLVANIA.

By H. C. Wood, M.D., LL.D.,

Professor of Therapeutics in the University of Pennsylvania.

Gentlemen:—The never-ending cycle of years, which, according to the old proverb, brings "all things to him who waits," has brought us to-day to a ceremony that occurs but once in a lifetime, and is always attended with the sorrow of departure and the joy of expectation. To-day your student life is ended, and as a representative of the Faculty of Medicine I stand here to close the chapter; to set the seal of the great University upon it, so that no man can reopen it, so that no man can challenge its completeness. To-day your medical life is begun, and as a representative of the great profession of medicine I stand here to welcome you to a brotherhood gathered out of all kindreds and tongues, joined together by the ties of a common knowledge and of a common consecration of that knowledge to the highest weal of a race everywhere broken by local interests and local selfishness into discordant and often warring fragments. Under these circumstances the old custom of the teacher with words of counsel crying "*Vale!*" farewell! to the departing student: of the medical brother with words of warning, shouting, "*Salve!*" all hail! to the new member of the order, is a custom full of propriety and of dignity, honored by the fathers, by us to be perpetuated with reverent conservatism.

Coming in contact as you have during the latter years daily with the Faculty of Medicine, it is but natural that in your thoughts they should be "the University," but let me impress upon you that the Medical Faculty is but an accident of the present; at most only a temporary, ever-shifting part of the University. Men come and go, but the University lives on. The elder Wood, the elder Pepper, Stillé, the

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younger Pepper: these men in the comparatively few years of my medical life have been the incumbents of a single Chair. As students of the University you have become part of it; as graduates of the University you will be the base upon which the whole edifice rests. Your success is the success of the University, and so those who are for the moment the authorities of the University wish you God speed in your new outgoing; and so I on behalf of the living Medical Faculty venture to give you a few thoughts based upon my own struggles and experiences, with the hope that some of them may help you in the coming contest for survival.

In a measure you have decided your course in life, but only in a measure; and the first thing that each of you should do is afresh to take an inventory of his own endowments and see what wares there are upon his own shelves that he can carry into the world's market. Some of you are fitted for surgeons; some for physicians; some for investigators; some for teachers; some to walk the city streets; some to ride the country roads; some for home consumption; some for the missionary fields that everywhere are clamoring for martyrs.

The discontent and the nervous unrest of the American largely depends upon the teaching that men are born equal and that to labor is to succeed. It is not true. Genius is not, as has been asserted, the power of work; though the power of work may be necessary for the development of genius. The miner may dig and dig and dig, and if the gold be not in the earth his labor is vain. Hence, see to it that you dig in the right direction; but once having settled in your own mind what you are fitted for, labor.

I have watched some generations of young lives seek their level, rising and falling in the world, and have always found that it is the man who takes care of the moments who steadily climbs upward. This taking care of the moments depends not simply or even chiefly upon the willingness to work, but upon that eager determination to *do* which leads a man to find something at which he may labor when there is nothing obviously pressing upon him; nothing, perchance, that offers any immediate direct reward for his efforts. The talent of finding work is perhaps a distinct one, but it is one that multiplies with using. It is a common saying with loafers, with ne'er-do-weels, with *taugenichts*, "that the world owes them a living." Not so, gentlemen; the world owes nobody anything. Charity is a gift, not a debt. The world wants not the man, but the fruit of his labors, and unless his labors bear fruit the world owes the laborer nothing. The talent for finding work is necessary and good, but it must be supplemented by the talent for completing work. Useless labor is but a busy idleness; useless is that labor which fritters itself away and ends in

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naught. What the world wants is men who have the talent for getting things done.

Make for yourselves, therefore, distinct plans of work, closely within the scope of your profession, if possible, in outlying territories, if necessary. Each day, each week, each month finish something; or at least finish the laying of some bricks in the structure which you are struggling to erect. Pardon me if I make here a momentary personal allusion. Circumstances in my youth led me of necessity into botanical work, away from and outside of my profession. I knew that the chapter would be but a comparatively short one in my life; that the work done would be at best but a foundation; but I determined to do something that should be in itself complete; and so I wrote one large elaborate botanical monograph, putting four years of work into it. I knew that it could not bring me direct professional preferment; but I knew that it would bring the reputation of doing work successfully; and that in its doing would be formed the habit of successful effort; and to-day nothing that I have accomplished gives me more satisfaction in the retrospect than does that bit of natural history work.

The basis of all high professional success is technical fitness for the success. This technical fitness, so far as concerns the physician, is twofold; it has to do with purely technical skill, and it has to do with the management of the human animal. For the acquirement of the professional skill it is important that you have clear ideas of what is desirable. It is not learning that makes a skilled physician. I well remember an old doctor, probably the most learned of his day in Philadelphia, and yet an absolute practical failure, because, as it was commonly said, when put in front of a patient he could tell you what every doctor from Hippocrates down would have done for that patient, but at the conclusion did not know what himself to do. It is not practical skill in the fundamental sciences which underlie medicine that constitutes technical fitness; chemistry is good; physiology is good; pathology is good; they must be known; to be a skilled laboratory worker in them is good; but they are not clinical medicine; further than this, even clinical medicine itself, as some view it,—*i.e.*, the knowledge of the nature of disease and the practical skill in recognizing such nature,—as but the beginnings of medical usefulness.

The crowning stone of the whole medical superstructure; the real excuse for the existence of the medical profession as a thing apart and by itself, is therapeusis or the art of healing. Death comes an unbidden summoner at every human feast, and, finally, closes the door of life to each. You live to put the evil day afar off; to prevent the closing of the door until the heads of the sated guests droop with weari-

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ness and they are ready to depart. A greater sorrow in the world than death is pain. It is as true to-day as it was in the ninth century, when Chahid, the poet of Bactriana, wrote it that "if pain gave out a fire the world would be forever darkened." These, then, are smoke like your functions: to stay the hand of death when possible, to lessen the pangs of life at all times. In doing this it is essential that you use your scientific knowledge, but it is equally essential that you strengthen the weak places in the science of medicine by every possible gleaning from empiricism.

In your therapeusis avoid all narrowness. There are "isms" and "sects" in medicine; there are alleged laws and routine systems of practice; but I adjure you that you rise above all such narrowness; that recognizing that there is no general therapeutic law you broaden your horizon until it is as wide as the universe; that you eagerly look for and appropriate any gems of value though they should be hidden in the foulest dung-hill of charlatanism. Be not homeopaths, but lay fast hold of whatever of truth lies scattered among the falsities of its system; be not allopaths, but gather all you can in this field; call yourselves not hydropaths, but be not too proud to learn even of these fanatics: listen to the childish prattle of the Christian scientist, that perchance you may catch one word of wisdom; pick from the rubbish heap of Thomsonianism. Medical sects are narrow glens, where men grope in perpetual twilight ignorant of, or, through very wilfulness, refusing the light beyond, but they often contain scattered bits of truth which are the birthright of every member of the medical profession who prefers to live his life in the open fields of rational medicine.

Perhaps one of the most disheartening and disagreeable experiences in connection with the practice of medicine is the fact that no amount of professional skill, even using the words "professional skill" as meaning the power of curing disease, will of itself with certainty bring practical success. Every one who knows the profession knows in it men who fall out by the way-side, never achieving, though they have both ability, learning, industry, and skill. They have good wares upon their shelves, but somehow they fail in bringing them to the market, and the careless public goes by unheeding. The qualities which make a successful dry-goods drummer will make a busy physician; if you imitate too closely the commercial drummer you will become a charlatan; yet if you are entirely oblivious of his arts you will become commercial failures. More than this, let me say to you that the medical man who fails commercially for lack of the qualities which are necessary for commercial success, usually fails also practically in getting his patients well. You will find that very often it is not so much the disease that you are called to treat as the individual;

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and if you fail not only to comprehend but also to apprehend this great fact, you may hope to do little good. The arrogance, the cheek, the falsifications, of many commercial salesmen are the attributes of the charlatan; the singleness of purpose, the energy, the thoughtful tact, which are necessary to the successful salesman are equally necessary to the successful physician.

In the very onset of your career begin to study individual characteristics as eagerly and systematically as you study disease and the methods of its relief. If you will look in your older dictionaries, such as the earlier editions of Johnson, you will find no such word as "tact." Now, its praises are in everybody's mouth. Why is this? Evidently because amid the growing complexities of multiplied individualities and the ever increasing refinements of civilization the value of tact is continually rising in the world's markets. Webster assigns as its synonym: feeling, touch, peculiar faculty, etc. The full definition of it would be: the power of doing the right thing at the right time when dealing with men and women. It is essentially an effeminate quality, but sits most gracefully on the strongest man. For its possession are needed imagination, self-abnegation, self-control; and these are the qualities which you must acquire, not one, but each and all.

Imagination founded upon a knowledge of the human character enables its possessor to appreciate the person who is to be controlled or antagonized. Are you able to sit in the seat of the other man, to see things as he sees them, to feel as he feels them, to be open to influence as he is open; then must you know the secret springs of his actions, the weaknesses of his character, the avenues through which he may be led. To avail yourself of this knowledge you must be willing and able for self-effacement.

Self-abnegation is not pure unselfishness; such a thing as pure unselfishness does not exist upon the planet; scarcely does it enter even into the human conception of the deity. Self-abnegation, as I here use the term, is the denial of present desires and present longings for the sake of something that is to be achieved, for something that is to be received in the future. This quality you must have. Self-control rests upon self-abnegation, but is something beyond.

As Professor Osler said once upon this platform, the medical man needs to have his finger always on his vaso-motor centres; but let me tell you this is but a half truth; the doctor wants his finger at all times and forever on every one of his nerve-centres. Do not dance because your heels want to fly up; do not act because the impulse is upon you; do not talk because your tongue is loose and restless. I have often thought that if there be any portion of the human anatomy which the devil especially inhabits it is Broca's convolution of the brain,

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as it is devoted to human speech. Certainly upon this centre put not your finger but your biggest thumb; for your very life hold it down if you can; sit upon it; do your best, too often it will blow off like a safety-valve.

Much more of counsel have I in my heart to give you, but remember these things and you have the core of a successful career; select well your work; laboriously complete something day by day; get technical skill; acquire tact; and you will have power over disease and power over men.

More solemn than the breaking dawn, when the world is waking from the unconsciousness that it is the mockery of death to the new life, are the moments when men are, as you are to-day, closing the chapter of one life-era and breaking the seals which open the new book. But fleet as the flying moments of the dawn is the time of the present; and so I hasten to break the seals and to welcome you to the brotherhood of medicine; wondering only whether the lessons which you have learned, or any words of mine, can make your minds apprehend the grandness of that brotherhood, coming forth, as it does, from a history that is lost in the gloom of prehistoric life; stretching out, as we trust, to a future as endless as that of the human race. Listen, I pray you, to the words with which a great teacher of medicine twenty-four centuries ago bound those who would be initiated into the mysteries of his craft.

"I swear by Apollo the physician, and Æsculapius and Health and All-Heal and all the gods and goddesses, that, according to my ability and judgment, I will keep this Oath and this stipulation,—to reckon him who taught me this Art equally dear to me as my parents, to share my substance with him, and relieve his necessities if required; to look upon his offspring in the same footing as my own brothers, and to teach them this Art, if they shall wish to learn it, without fee or stipulation, and that by precept, lecture, and every other mode of instruction I will impart a knowledge of the Art to my own sons and those of my teachers, and to disciples bound by a stipulation and oath according to the law of medicine, but to none others. I will follow that system of regimen which, according to my ability and judgment, I consider for the benefit of my patients, and abstain from whatever is deleterious and mischievous. I will give no deadly medicine to any one if asked, nor suggest any such counsel; in like manner I will not give to a woman a pessary to produce abortion. With purity and with holiness I will pass my life and practise my Art. Into whatever houses I enter, I will go into them for the benefit of the sick, and will abstain from every voluntary act of mischief and corruption. Whatever in connection with my professional practice, or not in connection with it, I see

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or hear in the life of men which ought not to be spoken of abroad, I will not divulge, as reckoning that all such should be kept secret."

Underlying this oath, underlying every complete medical life, is the thought of consecration, of something more and beyond mere personal gain and personal aggrandizement. He who seeks his reward in popular favor misses the ideal of his calling; he who feels that the highest goal is the confidence and trust of his fellow-practitioners has in thus far apprehended the true professional spirit.

I have been asked to speak to you of medical ethics; time fails, but let me say a few words. The soul of medical ethics is the recognition of the universal brotherhood of medicine, and the application of the Golden Rule: to do unto others as you would have them to do unto you. Based upon these principles, I venture to offer you certain aphoristic rules:

(1) To consider the doctor as a member of your own family, having an inherent right to your medical services; but to remember yourself not to abuse this right.

(2) To consider any discovery or any invention you may make as belonging not to yourselves but to the general profession.

(3) Never in any way to laud your own medical skill or to attempt to supplant in public or private estimation one of the medical household.

(4) To join yourself as soon as may be to the incorporated companies of your fellows for scientific and social intercourse, and for the cultivation of that professional conscience which often binds men more closely than their personal sense of right and wrong.

(5) Through good and ill report to stand by members of your own profession, unless they be guilty of moral evil.

Gentlemen of the Medical Class of 1895, *Valete!*—Farewell! As the sower goeth forth to sow, so does the strong arm of Fate to-day scatter you over this wide continent. In its villages and on its hillsides; in its cities and in its hamlets shall you take root and grow. Aye, farther out, beyond our Fatherland, must you wander; some shall abide and labor in the islands of far-off seas, while some shall struggle amidst the teeming millions of Asia or the crowded over-cultivation of Europe. Never, on this earth, shall we after this hour stand face to face, but let us in our growing never forget the glory of this our great Alma Mater, or spot her renown with an unworthy deed! Let us as the years go by ripen the perfect fruit; let us so live that in the great meeting of the multitudinous nations before the throne of the Eternal God we shall be brothers still bound one to the other by the bands with which we this day have ourselves enclasped.

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MEMORANDUM AS TO A NEW USE OF THYROID EXTRACT.

By J. William White, M.D.,

Professor of Clinical Surgery, University of Pennsylvania; Surgeon to the University, Philadelphia, and German Hospitals.

The effect of "thyroid feeding" and of ingestion of extracts of the thyroid gland has thus far attracted the attention of surgeons chiefly in relation to myxedema. In that disease the clinical results are beyond question, and the theoretical explanation—that the administration of the gland or of extracts from it, supply to the organism something that it requires and which is not furnished when the gland is degenerated or has been removed—seems entirely satisfactory.

The most obvious immediate effects, so far as nutrition is concerned, which follow this treatment in cases of myxedema are seen upon the cutaneous envelope and its appendages. The dry skin covered with desquamating epidermis becomes soft and supple; the scales disappear; the patches of alopecia or the moth-eaten appearance of the hairy scalp also vanish and a new growth of hair occurs; the twisted deformed nails grow out again with normal outline and symmetry. These facts naturally attracted the attention of dermatologists, who very soon began to employ the thyroid treatment in obstinate cases of psoriasis, xeroderma, lupus, etc.

The results have recently been tabulated by Jackson.[1] His table shows the following reported effects in 38 cases: *Psoriasis*, 26 cases; 10 cured (1 relapse in a month); 7 improved; 9 no change. *Xeroderma*, 5 cases; 4 improved; 1 no change. *Eczema*, chronic, 2 cases; 1 cured; 1 no change. *Lupus vulgaris*, 2 cases; both improved. *Rosacea*, 1 case, no change. *Ichthyosis*, 1 case, very slight improvement. *Dermatitis exfoliativa*, 1 case, no change.

It is fair to add that Dr. Jackson seems to think that the dangers of the drug in such cases outweigh the advantages. That is a point for the dermatologists to settle. What concerns my argument is the fact that in thirty-eight cases, having no connection with myxedema, there were twenty-five "cured" or "improved." That is to say, in more than 65 per cent. of such cases an undoubted influence upon the nutrition and activity of the skin was produced. This fact, known to me in a general way for some time, suggested a line of treatment in a case which gave me some anxiety.

On March 28, 1894, a young girl, who was dressing in front of a

[1] Journal of Cutaneous and Genito-Urinary Diseases, October, 1894.

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FIG. 1.—VIEW OF SCAR TAKEN IN OCTOBER, 1894.

FIG. 2.—TAKEN IN MARCH, 1895.

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mirror in a private car attached to a train running into a depot, was thrown violently forward by reason of the engine coming up with much force against a "buffer" at the end of the station, the brakes having failed to work. Her face struck the mirror, which was broken into many pieces. A large crescentic wound of the soft parts of the right cheek was inflicted. The concavity was upward. The base was thin and almost on a level with the zygoma. Bleeding was profuse. I saw her within a few moments, and under anesthesia cleansed the wound surgically and brought it carefully into position by interrupted sutures. Rapid union, entirely by first intention, followed. The scar was linear, neither depressed nor elevated, and although it had more color than the usual operative cicatrix, this was not more marked than was to be expected after a contused and lacerated wound.

In October, 1894, she was brought to Philadelphia again to see me. The scar had become many times its former size, was elevated, irregular, with a broad, dense base, and was extremely conspicuous and disfiguring. During October, November, and December various absorbent ointments, pressure by means of plaster, simple salves, and other means of local treatment were employed, but without avail.

In January, 1895, she again came to this city, and I put her upon thyroid extract, giving from two to four tablets daily of a well-known preparation, each tablet containing five grains. All local treatment was abandoned, the scar being covered only with a film of collodion to prevent abrasion or irritation and to keep up gentle pressure.

On several occasions marked elevation of temperature and quickening of pulse occurred, and once the symptoms in this regard were alarming. At all times there was a tendency to irregular and frequent heart action. In the course of a few weeks a perceptible change was noticed, and at the end of about six weeks the scar had in almost its entire extent come down to the level of the surrounding skin and the dense base had disappeared.

Fig. 1 represents a view of the scar taken in October, 1894, with a portrait lens, at a distance of four and a half feet.

Fig. 2 was taken in March, 1895, with the same lens at the same distance.

I am not disposed to claim that this was a case of so-called true keloid. There is said to be a clinical distinction between keloid growths and hypertrophied cicatrices, but it is, after all, based rather on the size of the growth and upon its course than upon any more definite differences. The clinical and pathological resemblance is far more striking. There is every reason to believe that all keloids originate in scars. The similarity between the histological phenomena of a keloid and of an overgrown scar almost amounts to identity.

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Agnew describes the appearances under the heading, "Hypertrophy of a Cicatrix or Keloid."[1] Tillmanns[2] says, "We distinguish, as do Warren, Kaposi, Deuéricz, and others, three forms of keloid: (1) a spontaneous, (2) a cicatricial keloid, and (3) the hypertrophied cicatrix." Bland Sutton[3] speaks of the spur-like processes which keloid sends out with the adjacent skin (noticeable in this case), and adds, "Structurally it is identical with cicatricial tissue."

All authors are agreed as to the inveteracy of both conditions. Involution may occur. When it does the growth has been classed as an hypertrophied cicatrix. More often slow increase in size is continuous; or no change whatever may occur for many years, and it is then called keloid. All surgeons who have essayed operation are familiar with the unsatisfactory results which follow. As Sutton says, "When a keloid is excised in the majority of cases it returns as the wound heals, and very generally the scars of the stitch-holes become the seat of keloid also."

On the whole, the case, taking the most favorable view of it, was in October last an annoying one for the surgeon, and, on account of the disfigurement, was distressing to the parents. I believe that no surgeon of sound judgment would have tried to get rid of it by excision. Local applications faithfully tried for three months failed. Potassium iodide even was administered, although I scarcely hoped that it would have any effect; and it had none. No other drug that I know of seemed even remotely indicated.

There are two possibilities that must preclude any positive conclusions from this single case. The scar may have been on the point of undergoing spontaneous involution; the collodion may have been an active factor in producing the result. But the date of beginning of the atrophy, its subsequent variation with the dose of the thyroid extract, and the previous failure of well-applied pressure make these suppositions improbable, and seem to justify a belief in relationship between the drug and the disappearance of the overgrowth. I report the case, at any rate, for the sake of the suggestion to which it leads up, of the trial of thyroid extract in other conditions involving the skin, intractable to operative surgery, and either on the border line of malignancy, like keloid, or definitely malignant.

[1] Surgery, Vol. I, p. 320.
[2] Principles of Surgery, Am. ed., p. 748.
[3] Tumors, Innocent and Malignant, p. 56.

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BACTERIOLOGY IN PELVIC SURGERY.

By Charles B. Penrose, M.D., Ph.D.,

Professor of Gynecology in the University of Pennsylvania ; Surgeon to the Gynécéan Hospital.

The bacteriological study of inflammatory diseases of the Fallopian tubes and ovaries has not only much enlarged our knowledge of the pathological processes affecting these structures, but also promises to be of practical value in the treatment of the morbid conditions.

The pathogenic organisms which are found in inflammation of the uterine appendages are the gonococcus, the streptococcus, and staphylococcus, the bacillus coli communis, the tubercle bacillus, and the pneumococcus.

The great majority of the cases of pyosalpinx may be divided into two classes : those which are caused primarily by the gonococcus, and are due to venereal infection, and those which are caused by the staphylococcus and the streptococcus, and are due to septic infection after abortion, labor, and operation. These two varieties may be mixed. The bacillus coli communis enters the abscess cavity secondarily through an adherent or morbid intestinal wall. Cornil[1] found bacteria in the substance of the wall of a partly necrosed intestine. Tavel and Lantz believe that though micro-organisms cannot pass through the wall of healthy bowel, yet they readily escape if the gut be the seat of even a slight lesion. Repeated bacteriological examinations made by different observers show that the bacterium coli commune is found in those cases in which a portion of the intestinal wall is in a pathological condition and is adherent to the abscess wall.

The pneumococcus has been found but a few times in the pus of pyosalpinx. Rosthorn[2] reports a case and states that he has been able to find only two cases reported in the German literature, and one in the French.

Hartmann and Morax[3] report two cases. The disease may occur unassociated with pneumonia or tuberculosis. The pneumococcus obtained from tubal pus seems to be excessively virulent. Death from sepsis has occurred from it, and inoculation of animals proves rapidly fatal.

Bacteriology has demonstrated that,—

(1) The pus—in suppuration of the uterine appendages—does not contain micro-organisms in every case.

[1] Arch. de Med. Exper., t. i. p. 353.
[2] Prager Med. Wochenschrift, No. 2, 1894.
[3] Annales de Gyn. et d'Obstetrique, 1894, No. 7.

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(2) The danger of peritoneal infection from the pus of a pelvic abscess is dependent upon the variety of organism present.

A micro-organism is present, at some stage of the pathological process, in every case of suppuration of the uterine appendages. As the disease progresses, however, the micro-organism dies and disappears, and the pus becomes sterile. Such a result probably occurs in every case which runs a chronic course for a sufficient time.

Bumm found that the gonococcus, when inoculated in blood serum, failed to grow after five or six days. Bockhart found that it failed to grow after twelve to fourteen days. Wertheim[1] found that the gonococcus died upon agar-agar and blood serum after forty-five days, —though repeated cultures were frequently made.

It seems probable that an acute attack of inflammation in a chronic case is accompanied by the presence of active micro-organisms. And in any chronic case there is always danger of infection by the bacillus coli communis passing through an adherent intestinal wall.

Many observations go to prove the statement that pathogenic organisms, in time, disappear in inflammation of the uterine appendages.

In twenty cases of pyosalpinx, examined by Wright,[2] the gonococcus was only found in four, and in the remaining cases, with two exceptions, no bacteria of any kind were found.

Hartmann and Morax[3] examined the pus in thirty-three cases of pelvic suppuration originating in the adnexa, with the following results: in thirteen cases the pus was sterile: in thirteen gonococci were found associated with the bacillus coli communis, when a pyosalpinx was intimately adherent to the rectum. Streptococci were found in four cases, in two of which the bacillus coli communis was also present. In two cases the pneumococci were present. In one the bacillus coli communis was found alone.

Shauta[4] found that in 134 cases of pyosalpinx the pus was sterile in 101; there were gonococci in eighteen; streptococci and staphylococci in fourteen; bacillus coli communis one.

Wertheim[5] gives the following interesting table of cases in which bacteriological examination was made of pus.

[1] Archiv für Gyn., Bl. 42, heft I, 1892.
[2] American Journal of the Medical Sciences, February, 1895.
[3] Loc. cit.
[4] Archiv für Gyn., No. 44, 1893.
[5] Loc. cit.

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Observer.	Number of Cases.	No Organism.	Gonococci.	Streptococci.	Staphylococci.	Pneumococci.	Harmless Bacteria. Saprophytic Bacteria.
Orthmann	8	7	1	0	0	0	0
Westermark	1	0	1	0	0	0	0
Schmitt	1	0	1	0	0	0	0
Stemann	1	0	1	0	0	0	0
Wertheim	9	1	6	0	0	0	1
Schaeffer	11	10	—	0	0	0	1
Menge	26	18	3	2	1	0	2
Zweifel	44	32	8	3	0	1	0
Reichel	1	0	1	0	0	0	0
Wertheim	15	4	10	1	0	0	0
	116	72	32	6	1	1	4

These references are enough to show that in the majority of cases of suppuration of the uterine appendages which come under observation the pus is sterile.

The ratio of the sterile cases to those containing organisms differs somewhat in the records of different observers. This should be expected. The operator who meets, and operates upon, the acute cases is he who most often will find pus-containing micro-organisms.

Since the recent acute cases, and perhaps the chronic cases during an acute attack, are those in which we are most likely to find pathogenic organisms, we should expect the septic or aseptic character of the pus in any case to be indicated by the symptoms presented by the patient. Hartmann and Morax[1] state that in their experience the pus was sterile in those cases which were of long standing.

In my own experience, the cases in which I have found micro-organisms have been those in which decided constitutional and local symptoms were present before the operation. These symptoms were, pyrexia, coated tongue, rapid pulse, marked pelvic and lower abdominal pain and tenderness; all the symptoms of an active inflammatory process. Shauta[2] states, however, that we can obtain no knowledge in regard to the character of the pus from the history given by the patient, the pelvic examination, or the temperature. The statistics which he gives seem to show that fever preceding operation is of no significance in regard to the pathogenic or non-pathogenic character of the contents of a pyosalpinx. There were 134 cases under his observation; 112 were afebrile and 22 were febrile. Of the 112 afebrile

[1] Loc. cit.
[2] Loc. cit.

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cases 88 contained sterile pus or no pus, 15 contained gonococci, 9 contained streptococci or staphylococci. Of the 22 febrile cases, 13 contained sterile pus or no pus; 3 contained gonococci, 5 streptococci or staphylococci, and 1 the bacillus coli communis.

In this connection it should be remembered that the demonstration by the microscope of pathogenic micro-organisms does not always prove that the pus is septic; for the micro-organisms may be dead or inert. The cases may be divided into three classes: those containing live, active micro-organisms; those containing dead micro-organisms; and those containing no micro-organisms. The second class represents the stage of transition between the first and the third. The second and third classes alike contain sterile pus. It is not always possible to determine, with the microscope, whether the micro-organisms are living or dead.

A fact of practical importance is that micro-organisms may be found not only in the pus of a pelvic abscess, but in the substance of the abscess wall. The pus may be free from organisms, while they are present in the wall. The pus may be sterile while the wall is septic.

Boisleux [1] states that in cases in which the bacteriological examination of the pus revealed no bacteria, he has injected the pus into the peritoneum of the guinea-pig, with no result; whereas inoculation by the abscess wall produced fatal sepsis.

The bacillus coli communis has often been found in the wall of an abscess adherent to the intestine.

Wertheim has found gonococci in the wall of the Fallopian tube. In the Bacteriological Laboratory of the University of Pennsylvania, streptococci and staphylococci have been found in the substance of the wall of a tubal abscess. In these positions the micro-organisms are probably often dead. Boisleux seems to have shown, however, that they may be actively septic.

The second fact, demonstrated by bacteriology, to which reference has been made, is that the micro-organisms found in suppuration of the uterine appendages differ markedly in their action upon the peritoneum. In other words, the danger of peritonitis or of peritoneal sepsis, after intraperitoneal rupture of a tubal abscess, is dependent upon the character of the micro-organisms found in the pus. The danger may be nothing or very great.

The pneumococcus seems to be virulent in the peritoneum. The gonococcus seems to be of but doubtful danger to the peritoneum.

Bumm,[2] in 1890, stated that the gonococcus was harmful only to the mucous membrane and died in serous cavities.

1 British Gynecological Journal, part XXXVIII.
2 Annales de Gynécologie et d'Obstetrique, t. XXXIII.

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Treves[1] says that the gonococcus dies in the peritoneum. The difficulty of reaching a definite conclusion in regard to the danger of the gonococcus arises from the fact that often there is a mixed infection in cases of gonorrheal pyosalpinx; or that other morbid conditions may be present in the peritoneum which render the gonococcus dangerous.

Shauta believes that the gonococcus may do harm in the peritoneum, though he is unable to offer positive proof of this fact. He reports two cases in which gonococci alone were found in the pus of a pyosalpinx removed by operation; and after death, which resulted from purulent peritonitis, large numbers of gonococci were found in the peritoneal pus. But staphylococci were also found in the peritoneum; and therefore the pathogenic influence of the gonococci becomes uncertain. The staphylococci may have gained ingress post mortem or during the operation. Though these cases therefore do not prove that the gonococcus can cause fatal peritonitis, they at least seem to demonstrate the fact that under certain conditions the gonococcus does not die in the peritoneum, but may multiply, and to this extent it is an element of danger.

Pus containing gonococci alone certainly seems to be less virulent in the peritoneum than pus containing some of the other micro-organisms. Shauta's statistics show that of fifteen cases of unmixed gonorrheal pyosalpinx,—where intraperitoneal rupture of the sac occurred during the operation,—two, those just referred to, resulted fatally; and in these two there is some doubt in regard to the origin of the infection; while in eight cases where the pus contained streptococci and staphylococci in which rupture occurred during operation, three resulted fatally.

Wertheim reports cases of virulent gonorrheal pyosalpinx in which escape of pus into the peritoneum in no way interfered with recovery after operation. The virulence of the pus was proved by inoculation in the human urethra. The gonococcus has never been found alone in the human peritoneum in a fatal case of peritonitis. Wertheim believes that the gonococci do not infect the surface of the peritoneum, but penetrate to the deeper tissues; and if they were properly sought for in these tissues they would be found. In the present state of our knowledge it can be said that the gonococcus is one of the least dangerous organisms in the peritoneum. Perhaps occurring alone in an uninjured peritoneum it is harmless.

The staphylococcus, streptococcus, and bacillus coli communis are the organisms which usually cause peritonitis or peritoneal sepsis.

An interesting table is given by Treves.

[1] Lettsomian Lectures, 1894.

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CASES OF PERITONITIS IN MAN IN WHICH MICRO-ORGANISMS WERE FOUND IN THE EXUDATION.

	Fraenkel Found Alone.	Tavel and Lantz.	
		Alone.	In Association.
Bacterium coli commune	11	15	16
Streptococci	7	3	15
Staphylococci	1	2	6
Pneumococci	1	0	2

The bacillus coli communis, as it occurs in the pus of a pelvic or abdominal abscess, seems to be very virulent. It alone is a very frequent cause of fatal peritoneal sepsis. The pyogenic organisms, the streptococcus, and the staphylococcus seem to differ in degree in their action upon the peritoneum. The streptococcus seems to be the more virulent, and is the one more usually found in cases of peritonitis.

Murphy[1] states that pus in which the staphylococcus and the inert bacillus coli communis predominated could be free in the peritoneal cavity for a long time and produce but very slight changes in the peritoneum. And such pus when injected into the peritoneum of animals caused no unpleasant symptoms. When, however, the streptococcus predominated, serious peritoneal lesions and sepsis followed.

Peritoneal sepsis depends not only upon the character of the organisms which have entered the peritoneal cavity, but also upon the character of the fluid in the peritoneum and the condition of the serous surface. All investigators agree that the healthy peritoneum has the most extraordinary power of absorption, and that peritonitis is most likely to occur when there has been chemical or mechanical injury to the absorbing serous surface, when a good culture-medium remains in the peritoneal cavity.

Extravasations of blood or serum in the peritoneal cavity, long exposure of the peritoneum, and damage to the serous surface all aid the development of peritonitis.

Experiments upon animals[2] show that injections of pathogenic organisms into the peritoneal cavity are most virulent if mixed with a culture-fluid which is difficult of absorption, or if the peritoneal surface has been injured by some chemical or mechanical irritant.

An important fact in regard to the development of peritonitis is the immunity—natural or acquired—which the peritoneum possesses, in some cases, from infection. This fact has been recognized clinically by abdominal surgeons, and has been demonstrated by experiments

[1] Medical News, January 5, 1895.
[2] Pavlowsky-Ebendas, 1889, Bd. CXVII; Growitz, Virchow's Archiv, 1889, Bd. CXVI.

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upon animals. Several observers have shown[1] that immunity from peritoneal infection by septic organisms can be produced artificially. A small dose of septic material is introduced into the peritoneal cavity of the dog, and after the animal has recovered from the disturbance produced, a larger dose is injected. This process is repeated with increasing amounts of the poison, until such a degree of immunity is acquired that the animal will survive a dose of septic material which in a control experiment would cause death within twenty-four hours.

The facts determined by bacteriology and by experiments upon animals which I have briefly recorded, have a direct practical bearing upon the surgical treatment of abdominal and pelvic diseases.

The subject of drainage, after celiotomy, is one which has been discussed so much that I approach it now with hesitation. The phase of the subject, however, which I wish to present is one which has received but little attention, and some consideration of it may serve a useful purpose.

I assume that it will generally be admitted that, though drainage after celiotomy should be avoided if possible, there are yet some cases in which the chances of recovery are greater with drainage than without it. The difficulty is to determine what cases absolutely require drainage. The chief object of drainage after celiotomy is to remove from the peritoneum any material which is or which may become septic. Blood or other material, suitable for the culture of bacteria, may become septic, excluding operative infection, either from septic organisms existing in the abdomen before operation, or from infection through the intestinal wall after operation.

Infection by organisms existing in the pelvis before operation, part, in fact, of the pathological process for which the operation is done, is the usual cause of peritoneal sepsis after aseptic celiotomy for disease of the uterine appendages.

Bacteriology, by demonstrating the sterility of the pus in the majority of the cases of pelvic suppuration which are subjected to operation, has eliminated from the class of drainage cases, a large number, in which, a few years ago, drainage was considered, by many operators, to be essential.

Though, in a good many cases, we can conclude from the history of the disease and the symptoms presented before the operation that the pus is in all probability sterile, yet we can never be positive of this fact without a bacteriological examination. Shauta says that we are unable to determine the septic or the sterile character of the pus from the history, or any of the symptoms before operation. The bacterio-

[1] Reichel, Deutsche Zeitschrift für Chirurgie, Bd. xxx, p. 1.

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logical examination can be made, in part at least, by the microscope during the operation. The microscope, unlike culture or inoculation, does not demonstrate fully the activity or virulence of the pathogenic organisms, seen in the pus. But it does demonstrate their presence; and to that extent it furnishes the operator with knowledge, which is of value in determining the best technique to follow in any case.

Shauta adopts the following plan of operation:

If the tubal abscess be small, an attempt is made to remove it entire, without rupture. If, however, the abscess should rupture during removal, the pus is immediately examined, and if it be sterile or contain gonococci the abdomen is closed without drainage. If streptococci are found, the field of operation is drained through the abdominal wound by means of iodoform gauze.

In the case of a large pelvic abscess which can be brought to the abdominal incision, a somewhat different technique is followed. The parietal peritoneum is sutured at a suitable position to the anterior surface of the abscess, and the rest of the abdominal incision is closed with sutures, a drop of pus is then withdrawn by means of a fine trocar, and a cover glass preparation is immediately made. If the pus is found to be sterile or to contain gonococci, the abscess is opened and washed out, and the abdomen is reopened and the sac completely removed. If, however, the pus contains streptococci or straphylococci, the operation is discontinued. After the lapse of a few days, when the parietal peritoneum has formed adhesions to the abscess wall, the sac is incised and drained.

The objection to the latter part of the technique just described is that the disease in many cases is not cured by mere incision and drainage of the abscess. Incision of an abscess, which has as its origin a pyosalpinx, does not cure the disease. Therefore it seems to me best in every instance to remove the whole of the abscess wall—first aspirating if the cavity be large—and, in case the contents be septic, to trust to sponging, washing, and drainage to avoid peritoneal infection.

In most of the cases of suppuration of the uterine appendages which I have operated on since October, 1893, bacteriological examination of the pus has been made during the operation whenever intraperitoneal rupture of the abscess took place, and the necessity for washing and drainage has been determined by this examination.

If the abscess can be removed without rupture, drainage is unnecessary. If rupture occurs and the contents are sterile, the pus is merely sponged out and the abdomen is closed. If rupture occurs and the contents are septic, the pelvis is washed with distilled water, or sometimes with a 1–2000 bichloride solution, and is drained with the glass tube or with gauze. I have also made similar bacteriological

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examination in all cases of ovarian and tubal tumors,—where there was doubt about the sterility of the contents.

The cases may be tabulated as follows:

Case.	No Organisms.	Streptococci.	Straphylococci.	Gonococci.	Bacillus Coli Communis.	
1	1	. . . .	. . . .	. . . .	. . . .	Mixed organisms, bacilli and cocci.
2	1	. . . .	. . . .	. . . .	. . . .	
3	1	. . . .	. . . .	. . . .	. . . .	
4	1	. . . .	. . . .	. . . .	. . . .	
5	. . . .	1	1	. . . .	. . . .	
6	1	. . . .	. . . .	. . . .	. . . .	
7	1	. . . .	. . . .	. . . .	. . . .	
8	1	. . . .	. . . .	. . . .	. . . .	
9	. . . .	1	1	. . . .	. . . .	Short bacilli, diplococci and a short bacillus resembling coli commune.
10	1	. . . .	. . . .	. . . .	. . . .	
11	1	. . . .	. . . .	. . . .	. . . .	
12	1	. . . .	. . . .	. . . .	. . . .	
13	. . . .	1	1	. . . .	. . . .	
14	. . . .	. . . .	. . . .	1	. . . .	
15	. . . .	1	1	. . . .	1	Diplococci, tubercle bacilli, a long bacillus.
16	1	. . . .	. . . .	. . . .	. . . .	
16	11	4	4	1	1	

All of the women recovered from the operation. In none were there any symptoms whatever of general peritonitis or of peritoneal sepsis. There was, however, a marked differenee in some cases, in the local condition,—the condition of the pelvis and incision,—and this difference seemed to be, without doubt, dependent upon the character of the organisms found in the pus. The sterile cases recovered easily without inflammation or suppuration at any point. In two of the cases, however, in which streptococci were found, there followed operation, suppuration of the incision, stitch-hole abscess, suppuration in the tube-track, and fecal fistula,—phenomena which emphasized the fact that it was the drainage which prevented peritoneal sepsis. That these conditions were not caused by infection at the operation or through the tube is rendered probable by the fact that similar combination of accidents never occurred in my experience in any case in which drainage was used for other than suppurative disease.

At present I use drainage whenever any pathogenic organisms are

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found; though there seems to be no doubt that the gonococcus and staphylococcus are less dangerous than the streptococcus and the bacillus coli communis. The bacillus coli communis demands drainage not only on account of the intrinsic virulence of the organism, but only because its presence proves an intestinal lesion which itself requires drainage.

I feel confident that, in following this method, I use drainage more often than is necessary; and that future experience will enable me to restrict still further the drainage cases. Those cases which contain the gonococcus alone, or a few staphylococci in all probability require no drainage; and there are some cases in which the organisms seen are dead, and, consequently, the pus sterile, though the microscope does not show this.

The examinations have been made for me by Dr. Beyea. Cover-glass preparations are made and are fixed in the flame of an alcohol lamp, and stained with carbol-fuchsin. A Leitz one-twelfth immersion lens is used.

The following cases—some of which have already been published—serve to illustrate this subject.

CASE I.—*Tubo-Ovarian Abscess with Sterile Contents and Chronic Endometritis.*—This woman had had septic infection after a miscarriage several years ago, and had since then suffered continuously with bilateral ovarian pain. Celiotomy was performed, and the appendages were removed on both sides, and the uterus amputated at the internal os. During the enucleation, a tubo-ovarian abscess the size of a turkey egg was ruptured on the right side, and the purulent contents escaped into the pelvis and were removed with gauze pads. The contents were immediately examined and pronounced sterile. The abdominal incision was closed without irrigation and without drainage. Convalescence was easy. There was no elevation of temperature and the woman has continued well.

CASE II.—*Tubo-Ovarian Abscess and Abscess of Broad Ligament with Septic Contents.*—This woman had septic infection following a miscarriage one year ago, and since then had suffered with repeated attacks of pelvic peritonitis. Celiotomy was performed during one of these attacks. All the pelvic contents were found matted together by inflammatory adhesions, and the thickened omentum was adherent transversely across the pelvis. Both tubes and ovaries were removed and the uterus was amputated at the internal os. An abscess cavity on the left side containing several ounces of pus involved the tube, ovary, and cellular tissue of the broad ligament. This abscess was ruptured and the pus filled the pelvis. It was examined and found to contain streptococci. The pelvis and lower abdomen were thoroughly

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washed out with warm water and drained with the glass tube. The woman had a slow, difficult convalescence, having a profuse discharge of pus from the drainage-tube, and after the first week a discharge of feces, the result of intestinal necrosis.

CASE III.—*Tubo-Ovarian Abscess, with Sterile Contents.*—The trouble in this case seemed to date from a labor nine years before. When celiotomy was performed, a tubo-ovarian abscess containing about one ounce of pus was found on the right side, and a chronically inflamed, closed tube and ovary on the left. Both appendages were removed, the abscess being ruptured during enucleation. The contents were immediately examined and pronounced sterile, The abdomen was closed without irrigation or drainage. Convalescence was very easy.

CASE IV.—*Double Pyosalpinx, Tubo-Ovarian Abscess with Septic Contents; Endometritis.*—This woman had had septic infection following a miscarriage five years before. She had a tubercular family history and was suffering herself with pulmonary tuberculosis. She had had frequent attacks of pelvic peritonitis, during the last of which, following a criminal abortion, she was operated upon. All the pelvic contents were matted together by adhesions, old and recent; a tubo-ovarian abscess the size of a child's head filled the left and posterior portion of the pelvis, reaching half-way between the umbilicus and the symphysis pubis. The tubes, ovaries, and the uterus to the internal os were removed. The abscess cavity was ruptured and the pelvis and lower abdomen were deluged with pus. Bacteriological examination was immediately made and a small number of streptococci were found. The pelvis was washed out thoroughly with warm water and drained with a glass tube. Convalescence was remarkably easy. The tube was removed in forty-eight hours, and the tube-tract was completely closed within a week.

CASE V.—*Tubo-Ovarian Abscess with Septic Contents.*—This woman had an acute attack of salpingitis following a miscarriage eight months before. Two weeks before the operation of celiotomy the uterus had been curetted, with the result of producing an acute suppuration of the left tube and ovary.

When the abdomen was opened a tubo-ovarian abscess about the size of an orange was found on the left side. The abscess was ruptured during the enucleation and pus escaped into the pelvis. Bacteriological examination showed large numbers of streptococci. The pelvis was washed with a 1 : 2000 solution of bichloride, and drained with the glass tube. Convalescence was very easy.

CASE VI.—*Tubercular Pelvic Abscess with Septic Contents.*—This woman was 27 years old and had never been pregnant. She gave a

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history of having had an attack of peritonitis three years ago, which confined her to bed for nine weeks. She had been in bed with what she considered a similar attack for four months before operation.

When the abdomen was opened, a large abscess cavity was found filling the pelvis and extending half-way between the symphysis and umbilicus. The purulent accumulation was roofed by intestines, there being no defined abscess wall. A large quantity of very offensive pus escaped into the general peritoneum. The pus was examined and found to contain streptococci and the bacillus coli communis. The tubes—pyosalpinx—and the ovaries were removed, and the whole pelvis and lower abdomen were thoroughly washed out with hot water and drained with the glass tube. More careful microscopical examination showed the abscess to be tubercular. A fecal fistula developed on the third day. The convalescence has been very tedious, on account of the extremely poor condition of the woman and the tubercular character of the disease.

RECURRENT SCARLATINIFORM ERYTHEMA.[1]

By M. B. Hartzell, M.D.,

Instructor in Dermatology, University of Pennsylvania.

The scarlatiniform erythemata possess a special interest because of their close resemblance to a much more serious disease, scarlatina. The ordinary forms are met with tolerable frequency, but the recurrent variety is much rarer, and merits attention not only on account of its resemblance to scarlatina, but because of its marked tendency to frequent recurrences, which may cause the patient much annoyance during months and even years. The following case, which has been under the writer's observation for a considerable period, well illustrates the salient features of the disease.

J. H., a diamond-setter by occupation, 22 years of age, was referred to me for an opinion concerning a cutaneous disease, of which he had had several attacks during the past two years. When seen for the first time he was in the midst of a typical attack, which presented the following features: A bright-red erythema covered the entire cutaneous surface, no part of the skin being exempt, although some portions were much more markedly affected than others, the trunk and thighs showing the most intense redness. A few hours before the

[1] Read before the Philadelphia County Medical Society, April 24, 1895.

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appearance of the eruption the patient experienced chilliness and slight nausea, which was followed by evidences of some elevation of temperature, although at the time of the first visit this was found to be normal. The tongue was furred, but there was no unusual prominence of the papillæ, nor was the throat abnormally red. At a little distance the eruption bore a close resemblance to scarlatina, but on closer examination it was noticed that the redness was uniform instead of punctate, as in the latter disease. Three or four days after the beginning of the attack the epidermis began to desquamate, coming away in large sheets upon the trunk; upon the legs and arms the desquamation was less abundant, and upon the face it was trifling, being fine and bran-like. The desquamation continued until the whole epidermis had been shed, the process being complete in about a week. Upon inquiry it was learned that this was the third attack from which the patient had suffered, the first having occurred a little more than a year previously, the second, two months ago. These differed in no respect from the one just described, both having been preceded by chilliness and nausea and followed by abundant desquamation. Two months after recovery from this third recurrence the patient again presented himself with a bright-red eruption covering the greater part of the trunk and thighs, extending from the level of the nipples in front, the lower angle of the scapulæ behind, to the knees. It had commenced on the inner and anterior surface of the right thigh, and had rapidly extended thence to the trunk, covering it uniformly below the level of the nipples, with the exception of two palm-sized patches symmetrically situated just beneath the margin of the ribs; here the skin was normal and looked preternaturally white in contrast with the bright scarlet of the surrounding parts. On the upper part of the chest, anteriorly and posteriorly, there were several variously-shaped patches, varying in size from a silver dollar to the palm of the hand, separated from the main sheet of the eruption by a considerable interval of sound skin. At the end of thirty-six hours the eruption ceased to spread, covering much less surface than in the previous attacks, and apparently less intense. Within a few days the skin had resumed its normal aspect without desquamation occurring. After an interval of six weeks the patient was again seized with nausea and vomiting, chilliness, pain in the back of the neck and occiput; within twenty-four hours the usual erythema followed, beginning upon the lower part of the trunk, back and front, extending to the thighs and arms, being limited in this latter situation to the flexor surfaces. During the first day of the eruption there were no subjective symptoms, but upon the second, when it had spread to the forearms and legs, itching and burning were marked. This attack was followed by a bran-like desquamation.

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On the third day of the third attack, when the eruption was at its acme, a small piece of skin was excised from the back just beneath the lower angle of the right scapula; this was fixed in alcohol, embedded in paraffin, and numerous sections made and stained with various reagents. Microscopical examination of these sections showed the corneous layer in the early stages of exfoliation, being held in place here and there by greatly elongated slender corneous cells. The stratum granulosum had almost entirely disappeared, being represented by a few cells with granular contents scattered here and there at the extreme margin of the rete mucosum. The rete showed but little change beyond slight thickening and vacuolation of a few of its cells. The most notable change was observed in the papillary layer of the corium; this contained a considerable number of small round cells, situated for the most part along the margins of the papillæ and around the blood-vessels. In a few places the round-celled deposit had encroached upon the margin of the rete, obscuring the line of demarcation between this layer and the papillæ. Petrini, who also examined a portion of skin excised from a case which he reported at the International Dermatological Congress held at Paris in 1889, found similar changes, with this important difference, however; instead of almost complete disappearance of the granular layer, he found this portion of the epidermis greatly increased in thickness. This is probably to be explained by the fact that he excised the skin examined after exfoliation had been going on for some time, while in the writer's case the examination was made before this had occurred.

When the patient came under observation in the first attack the eruption was regarded as probably due to the use of iodoform upon some abrasions which had been produced by a severe fall from a bicycle some days previously, the writer having several times seen this drug cause a similar erythema when applied to the skin, but the history of previous attacks when such agency could be excluded, and the occurrence of subsequent ones showed this view to be erroneous. Although the patient was carefully questioned as to his mode of life, and particularly as to his dietary, no trustworthy information was obtained in this direction as to the etiology of the affection. Overfatigue was regarded by the patient himself as the cause of the eruption, but the evidence as to this was altogether insufficient. The urine was examined for albumin repeatedly during the several attacks, but with negative results.

Erythematous eruptions resembling scarlatina are by no means rare, a large proportion of them being due to certain drugs, particularly those derived from coal-tar.

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The antipyretics and analgesics recently introduced into medicine in such large numbers are especially prone to produce scarlatina-like rashes. The external application of some drugs, as iodoform, is occasionally followed by such erythemata. In the case of iodoform the eruption is not always limited to the point of application, but often spreads far beyond, in some instances involving the entire cutaneous surface. Less frequently, alimentary substances may give rise to similar eruptions. Another class of cases, etiologically different from those just mentioned, arises during the course of certain general infections, such as puerperal sepsis, septic conditions following surgical operations, typhoid fever. These are the result of the general toxemia, and probably do not differ in the mechanism of their production from those the result of the administration of drugs. Of the same general character is the case reported by Crocker in which an eruption resembling scarlatina followed sewer-gas poisoning.

According to Brocq, Leloir and Vidal, as well as most of the French dermatologists, to whom we owe the most complete account of these erythemata, the recurrent variety must be separated from the ordinary forms both on account of the differences in the clinical course and, more particularly, because of its etiology. In the former the cause is usually to be found in the use of some drug, either internally or externally, or some article of food; in the latter no such cause is to be found except in rare instances.

The marked tendency to recurrences without ascertainable cause especially distinguishes it from the ordinary form. A curious feature of these recurrences, and one worthy of note, is the tendency to grow milder with each recurrence; this was observed in the case reported in this paper, and seems to have been a feature of the cases reported elsewhere, although no special note has been made of the fact. A probable explanation of this diminishing severity is to be found in a gradual establishment of toleration for the *materies morbi*, whatever this may be. Brocq, who has written elaborately on the subject, would place the malady among the inflammations of the skin, and prefers to call it desquamative scarlatiniform dermatitis. This author also suggests that it is quite likely that some of the mild cases of pityriasis rubra which have been reported were, in fact, examples of this disease. It is also probable that some of the cases of scarlatina in which the eruption was supposed to have returned should be classed with this affection.

Owing to its close resemblance to a serious infectious disease the question of diagnosis is of more than ordinary importance. It may be distinguished from scarlatina by attention to the following points:

The redness is apt to be diffuse instead of punctate.

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The eruption instead of beginning upon the face, as in scarlatina, usually commences upon some part of the trunk and spreads rapidly to other parts.

Desquamation begins much earlier than in scarlatina, usually on the second or third day of the attack.

Throat symptoms are absent, or, if present, are apt to be very mild.

The so-called strawberry tongue is absent.

There are never any symptoms pointing to the kidneys

Finally, the repeated recurrence of the eruption will make the diagnosis plain.

The treatment must be carried out on general principles. In the writer's case the internal administration of the fluid extract of jaborandi seemed to influence the disease favorably, mitigating the itching and burning.

REMARKS ON CHLOROSIS AND ITS TREATMENT.[1]

By Frederick P. Henry, M.D.,

Philadelphia.

The term chlorosis is derived from the Greek word χλωρός, which means greenish-yellow. By a slight stretch of the imagination the skin of a person of dark complexion suffering from chlorosis might be called greenish-yellow; but chlorosis is very common in Sweden, where the inhabitants are, as a rule, of very fair complexion, so that the name of the disease is, to a certain extent, a misnomer. It has, however, the sanction of ancient usage, and it would be hard to find another to which even greater objections could not be raised.

Etiology.—The chief predisposing causes of chlorosis are to be found in age, sex, and constitution. The forces emanating from these sources come to a focus, so to speak, in a case of chlorosis, and that which brings them to a focus is the advent of puberty. The principal of these predisposing causes is, I believe, a congenital tendency to anemia. Some years ago, while examining the blood of the new-born at the Maternity Hospital, I discovered an infant whose red blood-corpuscles numbered only 3,625,000 per cubic millimetre, the normal average being at least 5,000,000. Now, this child, which, by the way, was a female, might, under proper care, thrive until the age of puberty, when the demands made upon the blood and nervous system by the

[1] Read at the meeting of the Kentucky State Medical Society at Harrodsburg, June 13, 1895.

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evolution of the sexual system would, in all probability, give rise to well-marked chlorosis. The chief predisposing causes of chlorosis then are: (1) Sex, the vast majority of cases occurring in females. (2) Age, the decade between 14 and 24 years furnishing all the cases. (3) Constitution either inherited or acquired.

Exciting Causes.—The exciting causes of chlorosis are those of anemia in general, such as insufficient food, light, air, and exercise, overwork, either physical or mental, anxiety, grief, and nervous excitement in general. There is another exciting cause on which great stress was recently laid by a distinguished physician of London, the late Sir Andrew Clark, and which, therefore, deserves to be considered at some length. The cause to which I refer is constipation, and Clark considered it of such paramount importance that he used the term fecal anemia as a synonyme of chlorosis. This theory of Clark was based upon certain signs and symptoms that are more or less commonly encountered in chlorosis. Chief among them are digestive disturbances. The tongue is generally heavily coated at the base, large, flabby, and with its sides indented with the teeth. The breath is disagreeable, and sometimes, according to Clark, has a distinctly fecal odor. There is a sense of epigastric oppression after the ingestion of food. The bowels are either confined or inadequately relieved, and the feces generally consist of scybalous masses embedded in mucus swarming with bacteria. Pain in the side, generally most marked on the left, is a common symptom, and was believed by Clark to have its seat in either the hepatic or splenic flexure of the colon. This view of the nature of the pain in the side is corroborated by the fact that it is sometimes relieved by large enemata of warm water. According to the authority just named, it is a common thing for young girls to neglect the calls of nature so far as the bowels are concerned. The feces accumulate, and by their decomposition ptomaines and leucomaines are generated, absorbed, and by their poisonous action produce the multiform symptoms of chlorosis. A treatment based upon the theory that chlorosis is due to fecal retention is sometimes eminently successful, and will be referred to later in detail.

Another exciting cause of chlorosis is cold. Professor Augusto Murri, of Bologna, has recently published an elaborate paper on the influence of cold in the etiology of chlorosis. He gives the notes of three cases in which the symptoms of chlorosis were limited to the cold months of the year, disappearing in summer and recurring on the onset of the succeeding winter, and he states that others precisely similar have come under his observation. He, therefore, styles them "winter chlorosis," or *chlorosis hiemalis.* It is well known that chlorotic patients are affected unfavorably, as a rule, by such exposure to cold

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as is well borne by the healthy, and this Murri believes to be due to an instability of the vaso-motor system on the part of the former. In fact, he regards chlorosis as a vaso-motor neurosis, the blood-changes in the disease being dependent upon disorders of the circulation induced by cold, nervous shock, or long-continued irritation as from the genital organs. This paper is certainly a most suggestive one, teeming with facts and giving evidence of a thorough knowledge of the circulation in its healthy and diseased states. It is impossible to discuss it at length. Suffice it to say that it deserves the careful study of all hematologists.

Meinert, of Dresden, claims to have demonstrated a displacement of the stomach (gastroptosis) in sixty consecutive cases of chlorosis. Fifteen per cent. of the cases were complicated with right movable kidney, and in one both kidneys were movable. The gastroptosis is secondary to enteroptosis, and this in turn to the pressure of the corset, so that, according to Meinert, it is to this article of female apparel that chlorosis is indirectly due. After the cure of a case of chlorosis, its anatomical substratum, the visceral displacement remains, and hence the notorious tendency of the affection to relapse. No one doubts the evil effect of tight lacing, and all will admit that in an individual predisposed by inheritance or otherwise to chlorosis, the development of the disease may be accelerated by constriction of the thoracic base and consequent displacement of viscera.

It is scarcely necessary to add that there are those who regard chlorosis as an infectious disease. Among these are Clément, of the Hôtel Dieu, Paris, who bases his opinion of its infectious nature on the enlargement of the spleen which he has found in thirteen cases, on the frequency of febrile movement, the occasional complication of phlegmasia dolens, and the epidemic occurrence of the affection. The hypothesis is well argued, but the facts on which it is based are questionable.

Anatomical Characters.—From the fact that there is such diversity of opinion concerning the etiology of chlorosis it may almost be inferred that the anatomical characters of the disease are by no means uniform. Virchow endeavored to place the affection upon a distinct anatomical basis by the demonstration that, in fatal cases, there is often found an imperfect development of the aorta and arterial system generally. He has found the aorta of a full-grown woman so small as barely to admit the little finger, whereas normally it should admit the thumb, and with this contraction of the lumen of the vessel its coats were found to be much thinner than normal. He regards this condition of the vessels as congenital, and the importance of the observation depends upon the fact that the blood-vessels and the blood-corpus-

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cles are both derived from the same embryonic layer,—the mesoblast, —an imperfect development of the one necessarily entailing the same condition in the other. I have little doubt that Virchow's theory is true with reference to some of the cases, especially those that run a fatal course. A condition of imperfect development of the vascular system might doubtless give rise to grave disturbances of nutrition which would eventually end in death, but chlorosis is not, as a rule, a fatal disease, the great majority of cases under appropriate treatment ending in recovery, and with reference to them there is no proof that such a stunted condition of the blood-vessels is present.

The only constant anatomical characters of chlorosis are those of the blood itself, and it is for this reason that I classify the disease among the primary anemias. Even the blood-changes are not uniform. The researches of Duncan, in 1867, first established the fact that in well-marked cases of chlorosis the number of red blood-corpuscles might be normal while their percentage of hemoglobin might be greatly reduced, and this anomaly was for a long time regarded as the distinguishing mark of chlorosis. It has since been established that this view of the blood-change in chlorosis is altogether too narrow, and at the present day it is generally admitted that the changes in the red corpuscles may be at least threefold. (1) They may be of normal size and number, their only change being a deficiency of coloring matter. (2) They may be diminished in number with diminished percentage of coloring matter. (3) They may be diminished in size and normal in number and in percentage of coloring matter.

Of the above-mentioned varieties the second is the most severe, and in it there are often marked changes in the shape of the red corpuscles (poikilocytosis) such as are so commonly observed in pernicious anemia.

From these facts you will perceive that there is nothing uniform in the behavior of the red corpuscles in the disease called chlorosis, so that an attempt to describe it as a distinct disease from an anatomical stand-point must result in failure. The essential point is that the percentage of hemoglobin is reduced in this affection, and this is common to many forms of anemia.

It has been contended by some writers, especially by Immermann, that chlorosis differs from all other forms of anemia in that the albuminous bodies of the blood-serum are present in that fluid in normal or increased amount. This has certainly been proved to be true in a few cases by chemical examination, but it has not yet been proved that the same may not be true of other forms of anemia.

From the foregoing remarks it appears to me evident that the conditions of the blood and the other organs of the body are so various,

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not to say contradictory, as to veto the present establishment of chlorosis as a distinct disease. With advancing knowledge some etiological or pathological fact, common to all cases of the affection, may be discovered, but at present none such is known.

With our present knowledge, the most sensible view of the nature of chlorosis appears to me the following, which I have already expressed elsewhere:[1] At the time of puberty there is an urgent physiological demand upon the blood which is complied with by vigorous individuals without detriment to the organism. The ordeal of puberty is safely passed. In less vigorous, but still sound, healthy organisms, a decided degree of anemia, one calling for treatment declares itself at this time. Finally, in those with any congenital tendency to anemia, whether this may have been due to general malnutrition during intrauterine life, or to a special hypoplasia of the vascular system, the anemia of puberty is intense. The case is a typical one of chlorosis.

Complications.—There are certain diseases to which chlorosis stands in the relation of a predisposing cause, and which, therefore, may be regarded either as complications or sequelæ. The chief of these are phthisis, gastric ulcer, chorea, and exophthalmic goitre.

There can be no doubt that one of the best prophylactic means of averting phthisis pulmonalis is the maintenance of a good condition of the blood, and, conversely, that a poor state of the blood is often a pretubercular or pre-bacillary stage of phthisis. Gastric ulcer is by no means uncommon in chlorotic women, and its occurrence is favored by degenerative changes in the blood-vessels of the stomach leading to thrombosis and hemorrhage as well as by the hyperacidity of the gastric juice, which recent researches of Lava, of Turin, Cantù, of Pavia, and Osswald, of Germany, have shown to be the rule in chlorosis.

Chorea, it is well known, is decidedly more common in females than in males, and although more frequently observed under than over 15 years of age, is yet far from rare between the ages of 15 and 20. Its occurrence is undoubtedly favored by chlorosis, and the same is true of that peculiar neurosis known as exophthalmic goitre or Graves's disease.

Omitting, for the sake of brevity, any further remarks on diagnosis and prognosis, I will conclude with some observations upon the treatment of chlorosis.

Treatment.—As Immermann remarks, "there is scarcely any point in therapeutics so fully established as the remarkable efficacy of iron, in removing all the symptoms of chlorosis," but it does not follow that

[1] Anemia, by F. P. Henry, Philadelphia, 1887.

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iron should initiate the treatment in every case. Nearly all chlorotics are dyspeptic, and until the digestive disorder is relieved, the full benefit of iron cannot be obtained. In cases of atonic dyspepsia the simple bitters, such as quassia or gentian, or exciters of the smooth muscular fibres, such as strychnia or brucia, may be administered before meals, or if there is gastric dilatation, naphthol, salicylate of bismuth or chloroform-water may be given three or four hours after meals, as recommended by Le Gendre, in order to limit or stop the abnormal fermentations generally present in that condition. Hyperacidity of the gastric juice should be treated with full doses of alkalies—soda, chalk, or magnesia—from one to two hours after meals, and an acidity, with dilute hydrochloric acid immediately after eating.

According to Dr. Haig, of London, who has done so much to advance our knowledge of lithemic conditions, "iron cures anemia by clearing the blood of uric acid." When iron fails to cure chlorosis, he recommends its suspension and the administration of mercurials and salicylates until the blood is cleared of uric acid, after which improvement may occur even without the resumption of the iron.

There has been much discussion concerning the *modus operandi* of iron in chlorosis. A study of a few cases of chlorosis, perhaps even of one, will lead any reflecting physician to the conclusion that the cause of chlorosis is not a deficient supply of iron, but something that interferes with its assimilation. To begin at the beginning, we find that in mothers' milk there is more iron than is necessary to supply the wants of the new-born child, for distinct traces of the metal are found in its excrement. This also proves that the amount of iron necessary to maintain the normal composition of the blood is very small, for there is but a minute quantity of the metal in human milk. Nearly all our food substances contain iron, and there is probably no drinking water in which traces of it cannot be found. It is evident, therefore, that there is something which interferes with the digestion and assimilation of the iron, which is abundantly present in the food of chlorotic individuals.

Until quite recently no satisfactory explanation could be given of the efficiency of iron in chlorosis, and especially of the necessity of administering it in large doses, for it was known that very little of the drug was absorbed. Nearly all the iron given by the mouth can be recovered in the feces, and therefore it would appear that a large portion of the drug is wasted, and that equally good results might be obtained by its use in small doses. This, however, is not the case, and thanks to the investigations of a German chemist, named Bunge, we have, at the present time, at least, an idea of the mode in which iron is so efficacious in chlorosis.

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In the first place, our food, which contains all the iron we need, does not contain that metal in inorganic form, but in an exceedingly complex organic union. Now, in chlorosis, as is so emphatically insisted upon by Sir Andrew Clark, digestive disturbances are exceedingly common. Abnormal fermentations and decompositions take place in the gastro-intestinal tract, which give rise to the formation of quantities of sulphides. These decompose the iron contained in the food and completely unfit it for the purposes of nutrition. By administering an inorganic preparation of iron we protect the organic combinations of that metal in the food, for the sulphur in the intestine combines with the iron administered, and allows that normally contained in the food to be absorbed. This theory of Bunge also explains why it is sometimes necessary to administer colossal doses of iron, for, in such cases, the decompositions in the intestine are unusually active; sulphur is formed in large quantity and requires a proportionally large amount of iron to take it up.

It is only proper to add that Bunge's theory has lately been contested by Ralph Stockman, of Edinburgh, who claims to have cured cases of chlorosis by giving them sulphide of iron, and who contends that bismuth, manganese, and other drugs which are just as capable of absorbing sulphuretted hydrogen as is iron, are inert in chlorosis. Stockman, however, acknowledges that the promptest curative effects are obtained with inorganic preparations of iron. On the other hand, Forchheimer, of Cincinnati, believes in the therapeutic virtues of intestinal antiseptics in cases of chlorosis, and my own opinion is in favor of their efficacy.

There has been a good deal of discussion as to the relative merits of organic and inorganic preparations of iron, and there can be no doubt that both are effective. The protoxalate is a favorite salt of certain eminent French practitioners, while others claim that the best results are obtained with the sulphate. For my own part, I am accustomed to place the most reliance on the inorganic salts of iron, although I have obtained good results from both the malate and the lactate.

In conclusion, I will describe the method of treatment so strongly advocated by the late Sir Andrew Clark.

With careful attention to the diet and a tepid sponge, followed by brisk towelling both night and morning, he prescribes the following mixture, to be taken twice a day:

℞	Ferri sulphat.	gr. xxiv.
	Magnes. sulphat.	ʒ vi.
	Acid. sulph. aromat.	ʒ i.
	Tinct. zingib.	ʒ ii.
	Infus. gentian comp. vel quassiæ . . .	ʒ viii. M.

SIG.—One-sixth part twice daily, about eleven and six o'clock.

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"Occasionally this acid mixture produces sickness, dries the skin, and is otherwise ill borne." In such cases he prescribes the following alkaline mixture:

℞	Ferri sulphat.	gr. xxiv.
	Sodii. bicarb.	ʒ ii.
	Sodii. sulphat.	ʒ vi.
	Tinct. zingib.	ʒ ii.
	Spt. chloroformi	ʒ i.
	Infus. quassiæ	℥ viii. M.

SIG.—One-sixth part twice daily, at eleven and six.

Sometimes neither mixture agrees, and then he prescribes sulphate of iron in pill with meals, and a saline aperient on first waking in the morning. By this plan Clark claims that nine out of ten cases of chlorosis recover in from one to three months, and by careful attention to the bowels, taking twice a week a pill composed of aloes, myrrh, and iron, the recovery will probably be permanent.

There is one important fact concerning the treatment of chlorosis upon which stress has been recently laid by Stephen Mackenzie, and which I have had repeated opportunities of verifying. It is that while it is easy to improve the condition of a chlorotic girl up to a certain point, it requires great perseverance on the part of both physician and patient to effect a complete cure. The hemoglobin percentage may rise from 25 or 30 to 70 or 75, and may there remain for many weeks. The patient's general condition is vastly improved; she considers herself well and refuses to continue the treatment that has apparently cured her. Relapse, under such circumstances, is certain and speedy. Ferruginous preparations should be continued for two or three months after apparent cure.

FOR THE PREVENTION OF TUBERCULOSIS.

SIR BENJAMIN WARD RICHARDSON gives the following sanitary decalogue: First, pure air for breathing. Second, active exercise, outdoor as much as possible. Third, uniformity of climate. Fourth, dress that will sustain uniformity of warmth. Fifth, careful regulation of the hours of rest by the sunlight. Sixth, out-door occupation. Seventh, amusements that favor muscular development and sustain healthy respiration. Eighth, cleanliness in the broadest sense. Ninth, the avoidance of the ill-effects of cold. Tenth, an ample diet, with a full proportion of the respiratory foods.—*Asclepiad.*

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CARCINOMA OF THE LIVER, WITH CIRRHOSIS.[1]

By M. Howard Fussell, M.D.,[2]

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AND

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The object of reporting the two rare cases detailed in this paper is not only to put them on record, but also to call the attention of English and American writers to this form of primary carcinoma of the liver.

In only one work in the English language can I find any reference to the condition, at least under its proper name. Professor Osler[3] gives a description of this form of cancer which he quotes from Hanot and Gilbert's work, presently to be cited.[4] Other writers call attention to a form of disseminated carcinoma, but if they refer to the condition now under consideration, they fail to call attention to the very marked cirrhosis which is a chief feature of the condition.

The presence of cirrhosis with adenoma or cancer has, of course, been known for years, but it was perhaps not until 1876, when MM. Kelsch and Kiener[5] reported a case of so-called adenoma in which there was a marked and wide-spread cirrhosis. Later, in the same volume, they cited this case and several others where the same condition existed, and called attention especially to new formations which they believed arose in the biliary canaliculi.[6] Perls had previously described the same condition,[7] but the article is not so full nor does it lay such great stress upon the subject. In the first of the two articles Kelsch and Kiener accurately describe and separate two classes of tumors which had previously been styled adenomas. The first, as described by Wagner, Friederich, Willigh,[8] and others, comprises tumors which are multiple or solitary, and which vary in size from that of a millet-seed to quite large tumors, having a minute structure like a normal liver. They are either superficial or deep in the substance of the liver,

[1] Read before the Association of American Physicians, Washington, D. C., May 31, 1895.

[2] After a great part of this paper was written, the second specimen was obtained and handed to Dr. A. O. J. Kelly for microscopical examination. The work was so important to the completion of the paper and has been so excellently done that Dr. Fussell feels it but just that Dr. Kelly's name should be added as one of the authors.

[3] Practice of Medicine, p. 452.

[4] Finley and Adami have reported a case in the Montreal Medical Journal, April, 1895.

[5] à Contribution l'Étude de l'Adenoma du Foie, Arch. de Physiologie, 1876, p. 622.

[6] Loc. cit., p. 771, Néo Formation de Canalicules biliaires dans l'Hépatite.

[7] Virchow's Archives, Vol. LVI.

[8] Loc. cit.

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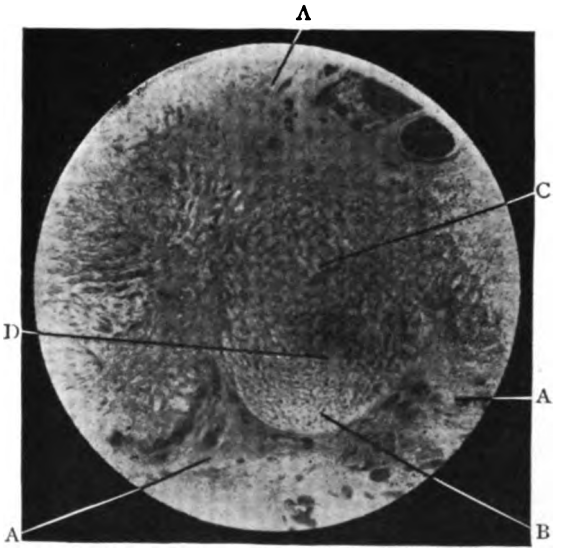

A, A, A.—Cirrhotic tissue.
B. Liver-cells.
C.—Cancerous tissue.
D.—Place of transformation of liver-cells into cancer-cells.

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sometimes encysted and sometimes with only a slight demarcation from the surrounding tissue.

Klob[1] believed them to be fetal. This is difficult to prove, but they are usually latent, are not concerned in any functional derangement of the liver, and are usually discovered in post mortems performed on patients dead of other diseases.

The second group comprises what the authors call true adenomas, but which the later writers, notably Hanot and Gilbert,[2] call adeno-carcinomas. They have, in common with the first group, the hepatic tissue, but with this difference, the cells are grouped in solid or hollow cylinders which make new formations resembling those of the tubular glands. These two groups are more distinctly separated by their clinical features. The first have no clinical significance, and, as remarked, are usually found accidentally. The second may often be recognized during life by larger or smaller nodes on the surface of the liver. These may cause pain, interference with the biliary secretions, and as they increase in number and size all the signs of degeneration of the liver appear in the patient.

To this class the name is now usually applied of adeno-carcinoma, and the primary cancer with cirrhosis belongs certainly to this division.

The description given by Kelsch and Kiener of their case is so excellent that I think it will be highly proper to give it here in full.

CASE I.—Man, aged 65 years, who had previously suffered from intermittent fever, was admitted to the hospital suffering more or less constant abdominal pain. The abdomen was prominent and more or less tympanitic. There was no jaundice when the patient entered the hospital, but this developed later. Ascites developed, and the patient died of exhaustion.

Autopsy.—Great emaciation; dropsy of all parts of body. The abdominal cavity contained ten quarts of bile-colored serum. The intestines floated on the liquid. The mesentery was thickened and of the consistency of dampened pasteboard. The omentum was thickened, was reddish, and contained fibrous masses.

The *liver* weighed 2085 grammes, or about nine and a half pounds.

The surface was deformed by bossellations of all dimensions, from a pin's head to an orange. These tumors were seen on both the upper and lower surfaces of the liver. The borders were in places crenated, in others bossellated. The gall-bladder distended. The capsule, which was generally thickened, was markedly so at the summit of the

[1] Loc. cit.
[2] Loc. cit.

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great bossellations, and in this position formed a bile-colored plaque. The general color of the liver was earthy gray, with yellow points in some places and in others red.

The consistency was very unequal, the greater bossellations were softened, elastic. In the depressed portions and in the fine mammillations, however, the consistency was very firm.

In the firm portions the cutting causes a creaking sensation, as in cirrhosis, while the softer portions cut easily. There were three kinds of alterations easily seen.

(1) The depressed and finely granular portions presenting all the characteristics of cirrhosis. The connective tissue is made up of opaline or reddened, very vascular, and circumscribed granulations, varying in size from the head of a pin to that of a small pea. These granulations are of a grayish ochre color, mostly firm, and can be scraped out with the back of the knife.

(2) The tumors, size of a hazel-nut to that of an orange, are softer than the fine granulations, and are generally circumscribed by a zone of hyperemic connective tissue, others are in a caseous state, and can easily be shelled out of their capsule, while still others are almost of a syrupy consistence.

(3) The larger tumors have a remarkable appearance on section. They are composed of several parenchymatous masses more or less softened, which are separated from each other by a whitish tissue, probably connective tissue.

Histologically a tumor the size of a hazel-nut shows the tumor to consist of a union of a number of nodules separated from each other by embryonal connective tissue and surrounded by a resisting fibrous envelope. The first stage of development is characterized by the cutting off of one or more normal acini or the appearance of miliary nodules in the acini.

In the first case one or more acini are circumscribed by embryonal connective tissue, the trabeculæ of hepatic cells become gradually converted into solid cylinders anastomosing among themselves.

In the second case, a round miliary nodule, composed of a group of epithelial cells in the form of cylinders, appears in an eccentric portion of an acinus, they appear to be continuous with the normal rows of hepatic cells, and are developed by cellular hypertrophy and hyperplasia. In growing, this little group of cylinders compresses the neighboring parenchyma, and the hepatic cells tend to atrophy. As they disappear they are in a measure replaced by connective tissue which surrounds the little nodule. This connective tissue surrounding the nodule is embryonal in character, later it becomes fibrous and encysts the degenerated tissue. This interstitial hepatitis is a concomitant and

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not a secondary process; it invades the parenchyma in the perilobular spaces following the distribution of the capsule of Glisson, and more rarely is an intralobular infiltration. The interlobular tissue in places is embryonal, in others more distinctly fibroid. The blood-vessels are numerous.

CASE II.—This case resembles very closely the one which I present to-day, and I therefore will give an abstract of Kelsch and Kiener's description.

Man, aged 60 years, admitted with slight jaundice and ascites. Liver somewhat enlarged, the border can be felt but is not unequal. A diagnosis of hypertrophic cirrhosis was made. After the man was tapped small irregularities could be felt over the liver.

Post Mortem.—Spleen atrophied. Liver weighs 1860 grammes, or about four pounds. The superior surface adherent to the diaphragm. Capsule notably thickened. The whole surface of the liver is covered with granulations varying in size from a pin-head to a hazel-nut. These prominences are soft and elastic. On section these masses are a sort of yellow magma very easy to dislodge with the scalpel. These tumors are spread throughout the liver, giving the remarkable appearance of a cirrhotic liver with the additions of tumors of varying size scattered throughout its substance. These tumors are surrounded by a fibrous capsule which is confounded with the fibrous tissue in which they are placed. The substance is generally firm, creaking under the knife, in some spots the substance is almost entirely fibrous, in others there are spots of bile-stained hepatic tissue.

Histologically, there is a remarkable interstitial hepatitis and small round masses enveloped in a fibrous capsule. These spots are the starting-points of the tumors; they are formed of an agglomeration of cylinders which represents all the characters of hepatic cells, except that they vary in size. They are polyhedrous with nuclei and nucleoli. They form anastomosing cylinders, sometimes with and sometimes without a central cavity. When the tumors are small, they are surrounded by a fibrous capsule, in the neighborhood of which are found the hepatic cells distended and displaced, and forming *rouleux* about the tumor.

The fibrous neoplasm is unequally distributed; in some places islets of liver tissue are simply surrounded by bands of inflammatory connective tissue, in others the acini themselves are invaded, the connective tissue penetrating between the trabeculæ and tending towards the centre. In other spots mere bits of parenchyma remain. The tissue is embryonal, infiltrated by small cells, and permeated by vessels with embryonal walls. There is an extraordinary development of the biliary canaliculi, some are bifurcated and anastomosing; they are often enor-

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mously dilated. In certain spots there are a number of these canaliculi separated one from the other by thin layers of embryonal tissue. They are lined by a single layer of cells. In certain parts it can be plainly seen that they form réseau which occupy the site of a liver acinus, and where the liver cells are about to disappear, their protoplasm becomes granular, the nuclei multiply and become surrounded by a protoplasm of the original hepatic cell.

The conclusions drawn by these authors are: (1) That the adenomatous (cancerous) nodules proceed directly from the trabecular réseau of the normal acinus of the liver. (2) That the accompanying cirrhosis is not a secondary but a concomitant process with the cellular new formation, depending upon the same irritative cause.

Rohwetter,[1] after quoting some authorities and giving some original observations, concludes that in his specimens he had to do with a true cirrhosis as proven by the enclosure of acini by growing connective tissue, the atrophy of the cells within these acini and the great increase of biliary passages. The cancerous nodules are in places totally separated from the liver tissue surrounding them, being old and indurated connective tissue, in places they are in connection with the liver tissue by a portion of their periphery. The first vary in size, some are separated into alveoli, others are not. The cancer nodules, which are in connection with the liver tissue show these facts. The free surface is in an advanced stage, while the angle formed by union with the liver tissue and the cancer nodule contains great numbers of round cells, these cells which have been detached from their normal position retain their normal order, but stain less easily than normal cells and have a less distinct contour.

He could see the direct transformation of the liver cells into cancer cells. The embryonal connective tissue surrounding the acini causes groups of liver cells to be pushed out which become the cancer cells.

He believes in his specimen the primary conditions to be one of cirrhosis, in which the liver-cells have made an attempt at regeneration, and for some reason, instead of becoming adenomata, have become cancerous tissue.

Sabourin[2] believes that the name adenoma is preferable to adenocarcinoma, though this view is not entertained by Hanot and Gilbert, next to be quoted.

This author states that when there is but a slight tendency to degeneration in the adenomatous tissue there is simply an overgrowth

[1] Leberkrebs und sein Verhaltnis zur Lebercirrhose, 1889.

[2] Contributions à l'Étude des Lesions du Parenchyme hépatique dans Cirrhose, Thesis, Paris, 1881.

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of connective tissue, and in a lesser degree of intensity, only a slight thickening of the walls of the capillaries. The sclerosed zone surrounding the adenoma is a secondary growth of tissue. The author is not decided in his view whether the new growth is secondary to the general cirrhosis or not.

Hanot and Gilbert[1] have given by far the fullest description of cancer with cirrhosis, and, indeed, are the first authors to make this a distinct form of primary cancer of the liver. In this volume they divide primary cancer of the liver into three forms,—massive, nodular, and cancer with cirrhosis. Of this latter form, the one under consideration, they give many instances, and it appears odd that more have not been recorded in this and other countries.

They say, while it is not irrational to suppose that a cirrhotic liver can become the seat of carcinoma, this condition is very rare, and, in reality, the coincidence of cirrhotic and cancerous lesions belong to primary cancer of the liver. Rarely cancer with cirrhosis results from the juxtaposition of cirrhotic lesions and massive or nodular cancers, but in the great majority of cases it is a neoplasm with the following characteristics:

The liver is not, as a rule, very markedly increased in size, the tumors may be seated deep in the substance of the liver, but they are usually scattered over its surface as well, giving it a rough and granular appearance. In places over the surface of the liver the granulations of cirrhosis can be recognized. The tumors are hemispherical without depressions, and of a firm consistence, of a whitish or yellowish appearance when recent. The size of the tumors vary from that of the head of a pin to a voluminous tumor; in cases, however, where the tumors are small, they vary but little, and the liver has almost the exact appearance of a hobnailed liver and may easily be confounded with it.

On section the tumors are seen to vary in size and color just as they do on the surface. In the majority of cases they are encysted by a fibrous envelope and can be easily removed by the point of a knife. It invades the venous system rather than the arterial or lymphatic system. Secondary infection is more common in this form than in the other two forms and invades usually the lungs.

Ascites is constant. The spleen may be congested or enlarged or sclerosed.

Microscopically, cancer with cirrhosis is a trabecular epithelioma. This form of epithelioma has been described by Kelsch and Kiener and by Sabourin as adenoma, but the preferable name is adeno-

[1] Études sur les Maladies du Foie.

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carcinoma or tubular epithelioma. This form is composed of a stroma and neoplastic trabeculæ, these anastomose as the normal trabeculæ of the liver from which they are derived. They differ from hepatic trabeculæ in their greater size and undulations. They are separated by a double row of endothelial cells or by new-formed sclerotic tissue. In a certain number of cases the trabecular grouping is evident in the whole tumor, while in others the older parts of the tumor are deformed and the growth becomes diffuse. The cirrhosis which accompanies this form of epithelioma is almost always a *true* cirrhosis, as proven by the great number of biliary canaliculi which are disseminated or collected in groups.

The epitheliomatous cells are certainly derived from the liver cells themselves.

"We believe that the adenoma and the cirrhosis are simultaneous, and believe that the two processes result from the action of the same irritant on the connective tissue giving rise to cirrhosis, and on the hepatic epithelium giving rise to the trabecular epithelioma, and we believe that either may be produced alone, though much more rarely the epithelioma."

Original Observations.—CASE I. I owe the privilege of examining and presenting this case to my colleagues, Drs. Mellersh and Cahall, of St. Timothy's Hospital, Roxborough, Philadelphia.

August A., aged 44 years, a native of Italy, was admitted to the wards February 15, 1894. He could give but little history of himself, but family history is good. He never used alcohol. Never had syphilis. He was admitted complaining of severe abdominal pain, which gradually increased until the patient's death. He was slightly jaundiced. The physical examination showed the liver dulness to reach from the nipple to four inches below the margin of the ribs. The edge of the liver can be easily felt and is rough and granular to the touch. The spleen is large and reaches five inches below the margin of the ribs. The jaundice gradually increased, ascites developed, and the man died of exhaustion. A diagnosis of hypertrophic cirrhosis of the liver was made. There was never any rise of temperature.

Post-Mortem Examination.—Man, middle-aged, slightly jaundiced. The thoracic organs were entirely normal. On opening the abdomen, the enlarged liver was found extending far below the edge of the ribs. The convex surface was tightly adherent to the diaphragm. The surface of the liver is markedly granular and is uniformly enlarged, giving a typical picture of hypertrophic cirrhosis save for its color. The color is a reddish-white, and gives the appearance of a huge carcinoma, notwithstanding the hobnailed appearance of cirrhosis.

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On section the cut surface is seen to be lobulated into small areas, it creaks under the knife, is quite uniform in its appearance, every square inch giving the picture of a cirrhotic liver. In no portion is there a distinct new growth and no sign of softening; the gall-ducts are normal, as are the mesenteric glands; the spleen is greatly enlarged and the capsule thickened. The pancreas is larger than normal, but there is no sign of a new growth. The pyloric end of the stomach is deeply pigmented. The veins around the cardiac orifice are uniformly enlarged. There are no new growths nor ulcerations in any part of the organ.

Spleen much enlarged, red, and soft, and on examination gives evidence of a monstrous hemorrhage into the organ.

Microscopic Examination.—There is a very marked cirrhosis of hypertrophic form, as shown by the great increase of intralobular fibrous tissue with embryonal cells. This fibrous tissue forms great bands between the lobules and in many places distinct islets of embryonal connective tissue. The lobules of the liver retain to a certain extent their normal shape and size, though many are flattened and divided by bands of connective tissue entering from the perilobular cirrhosis, while others are increased in size. In certain positions the lobules instead of being filled with liver cells or the cells presently to be described are filled with a connective tissue. The liver cells are almost entirely replaced by epithelial cells in the form of tubular cylinders, giving very much the appearance of tubular epitheliomas of the tubular glands. In every instance these tortuous cylinders are surrounded by an embryonal connective tissue, which enters from the perilobular connective tissue. The conversion of this embryonal tissue into connective tissue of a more fibrous character apparently gives rise to the islets of connective tissue above described, by reason of the atrophy of these cylinders.

The intralobular biliary canaliculi are increased in number and in size. In a few lobules there are slight remains of liver cells. These appear to be directly continuous with the cylinders of epithelial cells, which are more distinctly separated than the normal réseau of cells because of the connective tissue surrounding them. The cells of the liver which remain are cloudy, but are otherwise not degenerated, no traces of fatty degeneration being seen. So great is the conversion of the liver substance into connective tissue, cancer cells, however, that the source of origin of either cannot be made out from many of the specimens. It is quite evident, however, in these few spots that the regular colonettes of epithelial cells have their origin in the liver cells themselves.

This specimen is especially remarkable for the uniform and uni-

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versal conversion of the liver substance into cancer tissue. The liver would certainly be taken for a very good example of hypertrophic cirrhosis, at present, and in its fresh state only the color would have given an idea of its character. This, as noted above, was reddish-white, and the organ looked like a great scirrhus. In no place were there, strictly speaking, any tumors, the granulations were marked, but were evidently parenchyma cut off by fibrous tissue.

We have in this case a typical picture of the trabecular epithelioma accompanied by cirrhosis. It shows in certain points the breaking up of the trabeculæ by the sclerosed tissue, as described by Hanot and Gilbert. It differs, as I find no other specimen reported, in the uniformity of the invasion by the epithelioma, indeed it appears a massive cancer; there are no traces of the tumors of various size usually present and found in Case II.

The specimens in this case were kindly made for me by Dr. Samuel Kneass.

CASE II.—Mary B., aged 16 years. This person had been under the care of Professor Pepper for some months. She had intermittent hematuria, irregular menstruation, and a high degree of chlorosis. Suddenly, on April 27, 1895, she had a chill followed by high fever. On the evening of the same day she became unconscious, and remained entirely comatose until her death, May 1. She had a consolidation of the lower lobe of the left lung, constant hematuria, but passed a large amount of urine which contained a very few granular casts. An abdominal tumor was discovered, which proved to be the greatly enlarged spleen.

The following notes were made at the post mortem held twenty-four hours after death: The body of a well-nourished female. Rigor mortis very slightly marked; sternum prominent. The abdominal cavity contains perhaps three quarts of liquid, some of which was injected by the undertaker. The left lobe of the liver extends two inches below the xiphoid, and is markedly granular in appearance. A mass which proves to be the enlarged spleen is found lying in the left lumbar region.

Chest: The left pleural sac contains much liquid; the lung is adherent by recent adhesions to the chest wall at the base. The right lung is crepitant throughout, except at the extreme base, which is the seat of hypostatic congestion. The entire lower lobe of the left lung is the seat of an advanced carnification; the upper lobe somewhat congested.

Heart: Cavities on right side are entirely filled with ante-mortem clots; a small ante-mortem clot is also found in left side.

The *spleen* is large, five times its normal size; it is soft, yellow, but not friable.

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The *stomach* is dilated; the mucous membrane is studded with miliary hemorrhages.

The *ileum* and *jejunum* are normal.

The *gall-bladder* is large and filled with bile; the common duct is patulous.

The *pancreas* is large, but otherwise normal.

The *uterus* and *ovaries* are healthy. The kidneys are large and congested, and the cortical substance is apparently increased.

The *liver* weighs three and one-quarter pounds. It is quite as soft as a normal liver. The surface is glistening and markedly granular. The capsule is neither thickened nor opaque. In the capsule are stellate areas of capillary distention. The granulations which mark the entire surface of the liver are spread over the entire exterior, though perhaps they are most marked over the under surface. They vary in size from that of a millet-seed to that of a pea. Though on the upper surface of the left lobe there is a mass as large as a hazel-nut. This tumor is enveloped in a delicate fibrous capsule. A similar tumor is found in the depth of the right lobe. On section, the same granulations which form distinct tumor-masses the size of pin-head to that of a pea are scattered throughout the liver substance. They are irregular in shape and are enveloped in a delicate fibrous capsule from which they can be easily shelled. Towards the anterior edge of the right lobe they are more numerous than in the left lobe. There is no area of softening in any part.

Microscopical Examination.—With a low power we see enlarged and rather deformed lobules of the liver surrounded by a great amount of connective tissue containing many and in some cases enlarged biliary canaliculi.

It is noticed with the low power that the central vein of the lobules is not to be found in a single instance of many slides examined, and that in places a body corresponding in size and shape with a lobule of the liver is in the midst of a great field of connective tissue.

With a higher power the lobules of the liver are seen to be changed in the following manner: The cells are much larger than normal liver cells, and the protoplasm is apparently more cloudy, and towards the centre of the lobule begins to degenerate. These cells are arranged in trabeculæ, just as are the normal liver cells. There is no separation of these trabeculæ by connective tissue, as there is in the specimens of Case I, though they are separated by spaces filled more or less completely with cells.

The size of these lobules differs greatly, the larger being several times the size of a normal acinus of the liver, while certain specimens are smaller and can only be seen by higher powers. They are separated

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from each other by the perilobular connective tissue to be described. The round cells with which this latter is filled are more or less distinctly inserted between the colonettes of cells at the periphery; in other places the periphery is sharply marked off by connective tissue. In certain points along the periphery of some lobules there can be seen trabeculæ of cells which strongly suggest the conversion of these liver cells into true cancer tissue. They are cells separated from the acinus and arranged in more or less regular trabeculæ, being separated from each other and from the acinus by the infiltrating connective tissue.

The connective tissue, the tissue of Glisson's capsule, is markedly increased. The extent of its distribution varies in different parts. In places it simply surrounds the changed lobules of the liver or new growths, in others there is nothing whatever to be seen but wide bands of connective tissue of an embryonal type. In certain parts which contain no tumors visible to the naked eye, and which has the appearance of normal liver by the microscope, there is nothing but connective tissue, neither tumors nor liver cells being visible.

The finer structure of this varies, depending upon whether we have to do with an older or more recent process. In the first instance there are dense masses of connective-tissue fibres with but few nuclei, while in the latter the great number of nuclei of the nature of round-celled infiltration indicate the embryonal type of connective tissue. Here and there are seen nuclei changing from round to elongated forms, the commencement of fibre-formation. The connective tissue surrounding the nodules of new formation can be seen to penetrate from the periphery a varying distance into the nodule. This penetrating connective tissue is usually of the nature of round-celled infiltration. While this is the usual character of the infiltrating connective tissue, there is not infrequently distinct evidences of older connective tissue. What to a low power was one nodule surrounded by rather dense connective tissue is in reality made up of several smaller nodules, each surrounded by a connective-tissue envelope.

Embedded in this young connective tissue and making an integral part of it are great numbers of intralobular biliary canaliculi, in many places they are distended and form hollow cylinders, in other places the cylinders are swollen and blocked with detritus and cells. In some places they are much branched and anastomosing, forming in their regularity almost the picture of an adenoma. In no place, however, can one of these distinct columns be seen entering the lobules of the liver.

The vessels are not increased in size, and appear to have walls composed of this embryonal connective tissue through which they pass.

From careful study of these two cases they appear to belong to

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the same variety of tumor, but to be in different stages of the same process.

In Case I almost the entire number of liver acini is converted into masses composed of trabeculæ of epithelial cells, separated by connective tissue. In some places the formation of connective tissue has been carried to such a degree that the regular formation of réseau is lost, and the growth becomes the mixed variety mentioned by Hanot and Gilbert or the trabeculo-alveolar variety. In other and less numerous parts there remain some of the liver cells changed, but recognizable and undergoing direct metamorphosis into the true cancer cells.

In most instances the connective tissue totally surrounds the old lobule and makes a sharp line of demarcation between it and the surrounding connective tissue.

In Case II there appears to be an earlier stage of the same process, but sufficiently marked to be certain of the conditions.

There is a very advanced cirrhosis, but still so young that tissue which, to the naked eye, appears to be liver tissue is made up exclusively of fibrous and embryonal connective tissue. The liver cells are changed, in that they are enlarged and cloudy, and on the periphery of certain lobules a probable change from liver cell into cancer tissue can be seen.[1]

It would seem evident, then, that Kelsch and Kiener and Hanot and Gilbert are correct in the two points claimed by them, first, as proved by specimens from Cases I and II, that the new growth comes from a *direct change of the liver cells with the cancer cells.* And by Case II as proved by the overgrowth of embryonal connective tissue and the evident simultaneous change of the liver cells; that both processes, cirrhosis and new growth, arise at the same time, being results of the same irritant (whatever that may be) on the connective tissue on the one hand and the liver cells on the other.

The first effect has, unquestionably, been a great formation of embryonal connective tissue, and at the same time a hyperplasia of the liver cells, with the union of two or more acini, which form the nodules so evident to the naked eye. Later the change from hyperplastic liver cells to cancer cells takes place apparently always from the periphery. We then have—

(1) Cirrhosis with hyperplasia of liver cells, or the formation of nodules visible to the naked eye.

(2) The embryonal connective tissue gradually becoming fibrous and the liver cells converted into cancer cells.

[1] Dr. William Welch, of Baltimore, and George Dock, of Ann Arbor, are inclined to think that the changes in Case II can be accounted for by the cirrhosis alone, but the very marked microscopical resemblance to cases of cancer with cirrhosis and the grouping of certain cells, noted above, have decided us to report the case as one of this same type.

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In Case II all the steps may be distinctly seen; in Case I the entire organ is converted into a trabecular epithelioma, with but very few recognizable liver cells. The process must certainly be an infection of no ordinary type to bring about the general connective tissue change, and at the same time the conversion of every liver acinus into a nodule of new formation, which soon becomes a cancer.

The etiology of this special form of cancer would seem to be an infection of some sort affecting the tissue of the entire liver, of its nature we are entirely unable here to speak. In Case II there appears no tenable cause, the girl never used alcohol, was a virgin, and there is no reason to suspect syphilis, as she has several healthy brothers and sisters.

Hanot and Gilbert still leave the etiology of this especial form of cancer, as well as cancer itself, in the cirrhotic state it has maintained for so long.

The diagnosis of cancer with cirrhosis is difficult always. The signs must vary in any given case, with the degree of cirrhosis on the one hand and of cancer on the other.

The diagnosis of Case I, as has been stated, was hypertrophic cirrhosis, and I fail to see how any other diagnosis could have been made.

Case II was obviously impossible to diagnose. There was not a single feature pointing to derangement of the liver. If a diagnosis of primary carcinoma of the liver is made by the physical signs, and there is ascites, it would be well to keep in mind the possibility of a concomitant cirrhosis, for ascites is rare in simple primary cancer of the liver.

On the other hand, if a diagnosis of cirrhosis is made and there is rapid anemia, the rapid appearance of the conditions, the icterus and cachexia are points in favor of concomitant carcinoma.

The treatment must necessarily be directed to making the patient comfortable; unfortunately we have no means at hand which gives the least hope of a permanent removal of the trouble.

The Astley Cooper Prize.

The above-named prize of £300 will be awarded to the author of the best essay on diseases of the joints produced by syphilis and gonorrhea. Essays, in English or accompanied by an English translation, should be sent to Guy's Hospital, London, before January 1, 1898, accompanied by the usual motto and sealed envelope. For further particulars, address Dr. Hale White, 65 Harley Street, London, W.

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A CASE OF ACUTE ARTICULAR RHEUMATISM COMPLICATED BY ACUTE ENDOCARDITIS, FOLLOWED BY GANGRENE OF THE FOOT IN A CHILD.

By A. R. Allen, M.D.,

Carlisle, Pa.

Mabel K., aged 10 years, a healthy, well-nourished child of good family history, was prostrated by an attack of acute inflammatory rheumatism. Several days previous to seeing the child she had complained of slight headache, fever in the afternoon, and vague pains throughout the body.

The first examination showed swelling of the left knee, the skin of which had a red angry appearance, and soreness and stiffness of the right hip when moved. Temperature, $102\frac{8}{10}°$ F.; pulse, 104; restlessness, the patient tossing to and fro on the bed and complaining greatly of acute pain, especially in the knee.

The following day the general appearance of the child was much the same. The pain had subsided in the knee and located in the ankle of the same leg, the condition of the hip remaining the same. Temperature, $102\frac{1}{2}°$ F.; pulse, 108; tongue coated; the bowels slightly constipated.

Examination of the patient next morning developed the fact that acute endocarditis had ensued during the night. Pain over the cardiac region was complained of; a systolic murmur was heard at the aortic orifice; the first and second sounds of the heart were somewhat muffled. A solution of potassium iodide, digitalis, and sodium salicylate were ordered to be given. Rochelle salt was given to overcome the constipation, and hot applications were applied to the chest over the region of the heart.

The following day the pain over the cardiac region had greatly increased; pulse weak and thready, 128; the murmurs more marked, and the heart dulness increased in area; temperature, $103\frac{1}{2}°$ F.

Stimulants were ordered in the form of eggs, milk, and brandy. The digitalis mixture was then given every four hours.

During the night the pain over the cardiac area had diminished in intensity, the patient resting much more comfortably than on the previous day. During this time the rheumatic condition had been much alleviated, the ankle, knee, and hip improving greatly.

The next morning, on examining the patient, a large blister was found covering the toes and extending as far back as the junction of

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the tarsal and metatarsal bones, excepting on the inner aspect of the foot, where it only extended back as far as the base of the great toe.

The family was immediately informed of the change and the new developments that had ensued during the night: that gangrene would involve the portion of the foot covered by the blister.

During the night a small piece of lymph must have been detached from the surface of the inflamed valves of the heart and lodged in the external plantar artery, stopping the flow of arterial blood supplied to that portion of the foot covered by the blister. Every effort was made without any success to get rid of the embolus. Finding all efforts unavailing, poultices were applied to hasten the separation of the parts.

The stimulants were ordered to be increased, the digitalis mixture stopped, and a preparation of iron, quinine, and strychnine given instead. A few days later the general condition had so improved that after consultation with Dr. Hemminger amputation was decided upon.

During the night there was a recurrence of the rheumatic fever, precluding an operation at the time appointed. The temperature ran up to 104° F., and the pulse to 135. The right hip became intensely painful and the left elbow very much swollen. In addition to the above there was evidence of septic absorption. Every effort was made to combat these conditions. After several days' close attention and careful nursing the child again began to improve, the fever disappearing, and the night-sweats which had developed gradually grew less. The line of demarcation at this time showing very plainly, as the soft parts were rapidly separating from the gangrenous portion of the foot. The child being very weak, it was decided to still further delay the amputation and wait until sufficient strength had been regained to enable her to withstand more safely the shock of operation.

The foot was washed twice daily with a solution of permanganate of potassium. A few days later a slight separation of the gangrenous portion of the foot on the upper aspect occurred sufficiently large to allow the insertion of a nozzle of a syringe, and the parts were thoroughly irrigated twice daily for several days, when the sloughing had progressed so far that the dead portions could be clipped away. It was then found that healthy tissues extended forward to the base of the toes and to the second joint of the great toe. This being unexpected and gratifying, all ideas of amputation were abandoned. The separation of the gangrenous portion was now rapid. In a few days the bones of the toes were clipped from their tarsal articulation, excepting the two phalanges of the great toe, which were a few days longer in separating.

The foot had now a healthy appearance. Granulations were springing from the edges of the wound. On the sole of the foot

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PULSATING EMPYEMA IN A CHILD OF FIVE YEARS. RECOVERY.

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posterior to the base of the third and fourth toes the ulceration had extended deeper than elsewhere, causing a triangular indentation considerably deeper than the surrounding portions.

The embolus, according to the line of demarcation, must have lodged at the origin of the plantar arch, as the parts involved in the gangrenous process were supplied by its branches.

At the present time the foot has completely healed except a small space over the second and third toe about the size of a five-cent piece. The child is in good condition physically, there only remaining as a reminder of her illness some thickening of the aortic valves and a slight limp in walking.

PULSATING EMPYEMA IN A CHILD OF FIVE YEARS; RESECTION OF A RIB; RECOVERY; REMARKS.

By H. Toulmin, M.D.,

Instructor in Physical Diagnosis, University of Pennsylvania.

The interesting features of the following case were so decided and the relief following free drainage of the pleural cavity so pronounced, that a full report seems warranted. The case also presents several points which are still open to discussion, and adds one more to the list of recoveries after empyema.

Harold S., white, male, aged 5 years, was born at full term after a normal labor. The family history was negative. There was no constitutional disease. He had always been healthy.

Early in May, 1894, a sister, aged 7 years, was noticed to have whooping-cough, and in the latter part of the same month Harold developed the same disease. Home remedies were given to both until June 13, when the sister was so ill that Dr. J. H. Musser was sent for, and, on account of the urgency of the case, asked me to join him in attendance. Three days later the physical signs of croupous pneumonia developed and the little girl died on June 21. Symptoms of meningitis were present the last three days. No autopsy was secured. In the mean time the young brother had been kept from the sick-room and seemed to be practically well, his attack of whooping-cough being a mild one. But on June 30 he was taken with severe vomiting, mild fever, and slight epigastric pain. The attack was apparently referable to a meal of canned salmon, partaken on June 30, at mid-day. The pain continuing and the fever increasing, I was prepared for the physical signs of pneumonia, which were present on the morning of

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July 3. Consolidation began at the left base posteriorly, and in four days the entire lower lobe was involved, and there was a small area of consolidation along the lower border of the upper lobe. With the exception of the severe pain, there were no evidences of pleurisy. The pulse ranged between 100 and 120, the respirations were about 28, and the temperature varied from 101.7° F. to 103.6° F. The course of the disease was typical, the temperature returning to normal on the eighth day, July 7, and with commencing resolution there was a return of the whoop, which had disappeared for the time being.

Resolution took place slowly, and convalescence seemed to be progressing satisfactorily until July 25, when Dr. Musser saw the case in consultation. It was then noticed that the general condition of the boy was not so good. He was no longer gaining strength or flesh, and his color was poor. The respiration was a little quickened and the pulse-rate increased. The temperature remained normal. There were no chills or sweats. Physical examination revealed what had not been present before,—a pulsation in the second and third right intercosta spaces, one-half inch to the right of the sternal border, with dulness on percussion. There was in addition an impulse in the normal position of the apex-beat, easily seen and fairly strong on palpation. There was only slight expansion of the lower half of the left chest. The interspaces were not bulging. Tactile fremitus was almost the same over the upper halves of the chest, but it was much diminished, though well appreciated over the lower left, to the base. On percussion, there was diminished resonance on the left side at the apex anteriorly and posteriorly, extending to the third interspace in front and nearly to the angle of the scapula behind. Below these points there was dulness on light and impaired resonance on deep percussion. Auscultation gave us harsh respiration at the apex, high-pitched, almost blowing breathing below the clavicle, in the upper axilla and between the scapular ridge and angle; while in the lower axilla and from the angle of the scapula to the base there was a weak, distant respiratory murmur. Vocal resonance was heard everywhere, though feebly at the base. There was nowhere bronchophony or egophony. The stomach tympany was increased upward.

Two days later the pulsation on the right side had moved to the mid-clavicular line, in the second, third, and fourth interspaces, and was more powerful. Tactile fremitus, vocal resonance, and breath-sounds were much diminished at the base of the left lung. A fairly strong impulse was seen and felt in the fourth and fifth left interspaces, within the mid-clavicular line, over an area of about four centimetres in diameter. There was no movable dulness. Respirations 36, pulse 120, temperature normal in the morning and evening. It was decided

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that we were dealing with a pulsating pleural effusion, and aspiration was advised. The parents were averse to anything like an operation, but finally permission to aspirate only was given on the 30th, when the physical signs were practically the same as last given, except that posteriorly dulness on light percussion extended slightly higher.

The removal of 400 cubic centimetres of thick pus was accomplished without difficulty. After the skin had been frozen with rigolene, and a needle of large size inserted in the seventh interspace on a line extending down the chest from the angle of the scapula.

The aspirated fluid was examined by Dr. Arnold in the laboratory of the Presbyterian Hospital. Stained cover-slip preparations showed it to contain pneumococci, and pure cultures of the same resulted from stab and plate preparations.

After the operation the pulsation on the right side extended only two centimetres beyond the sternal border, while the maximum impulse was over the sternum. The impulse in the region of the normal apex-beat had not changed in the least. The physical signs over the lungs were not appreciably altered. The respirations dropped to 28, the pulse to 112, and the temperature remained normal. Slight improvement continued for three days, when the pulsation began moving again to the right, and by August 6 was one centimetre beyond the mid-clavicular line. The evening temperature on the 2d was 101° F.; on the 3d, 103° F.; on the 4th, 103.2° F.; and on the 5th, 103° F. Respirations remained about 36 to 40, and pulse 120 to 144. There were slight sweats, no chills; appetite very poor, color fair; child able to be up and about the house.

Resection of a rib and free drainage were recommended, but the parents would not listen to such a procedure until August 10. The physical signs at this date were as last noted, but the general condition was not nearly so good.

On August 10, the patient having been etherized, Dr. Tunis resected about two centimetres of the ninth rib posterior to the posterior axillary fold. No hemorrhage occurred sufficient to require the use of a ligature. Care was exercised to preserve the periosteal covering of the rib by slitting and dissecting it out of the way before excising the bone. The parietal pleura was very tense, the pus being thrown many feet when it was punctured. It was estimated that 1500 cubic centimetres were evacuated. It had the same characteristics as that removed by aspiration, with the addition of numerous cheesy flakes. A double drainage-tube was introduced and a genuine dressing applied. The boy stood the operation very well. Immediately after its termination the heart-beat was noted one inch to the right to one inch to the left of the sternum and from the second to the fourth ribs. The pulsation in the fourth and fifth interspaces had disappeared.

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The discharge was very free and necessitated daily renewal of the dressings. On August 17, the general condition had improved. The appetite was very good, the discharge had lessened considerably though it had become foul smelling. He was stronger, the pulse was slower, and the respirations quieter. The former was timed at 120, the latter at 28; the temperature in the late afternoon was 99.4° F.

On inspection, palpation, and percussion, the heart was found in its normal position. The left chest had fallen in perceptibly. The wound was healthy. There was good movement of the upper zone; fair resonance to the third rib in front and to the middle of the scapula behind; a good vesicular murmur was heard over this area. The lower zone was occupied by the discharging abscess cavity. On account of the foul smell of the discharge, the cavity was washed out for the first time with carbolic solution, 1 to 100, followed by a weak permanganate solution. A small drainage-tube, one-quarter of an inch in diameter, was retained in the abscess cavity until the discharge had been reduced to a few drops a day.

He continued to improve and the discharge ceased altogether in the middle of October. The boy's present condition—December—is as follows:

A very healthy-looking, well-developed, active boy; color bright and clear; chest well formed and perfectly symmetrical; expansion good and equal. The two sides measure exactly the same. The scar over the ninth rib small, not depressed, healthy. Tactile fremitus equal on the two sides. A separation between the cut ends of the ninth rib cannot be made out. The percussion note is normal everywhere; even at the extreme base of the left lung the note is not perceptibly higher in pitch than at the right base. The respiratory murmur is normal over the entire chest.

Heart.—Apex-beat in fifth interspace within the mid-clavicular line; no retraction of interspaces; area of dulness normal; sounds clear. The result is a remarkable one.

The interesting features of the case are:

(1) The close relationship of cause and effect between whooping-cough and pneumonia, and pneumonia and empyema.

(2) The infectious nature of pneumonia.

(3) The favorable termination of cases of empyema due to the pneumococcus.

(4) The practical prognostic value of bacteriological examination of the pleural contents in cases of effusion.

(5) The importance of surgical interference in empyemas, and the excellent results which follow.

(6) The abnormal area of pulsation.

Only this last point will be considered.

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At a meeting of the Association of American Physicians in 1893, Dr. J. C. Wilson[1] read a paper on "Pulsating Pleural Effusion," in which he cited three cases at length, and gave a most complete table of all cases published up to that time.

Besides the full notes on his own three cases, short notes are given of sixty-five other cases. I have been able to find reports of three similar cases as follows:

No. 69. Lorenzutti.[2]—Male, aged 20 years; no previous disease; left-sided effusion; pulsation in left mammary region synchronous with heart-beat; cardiac pulsation in second intercostal space to right of sternum. Aspirated, 600 grammes of purulent fluid; death; autopsy.

No. 70. Proust.[3]—Female, aged 23 years; left-sided pleural effusion; aspiration, purulent fluid; heart to right of sternum; pulsation to left of sternum,—aneurism thought of. No pneumothorax.

No. 71. Béclère.[4]—Male, aged 31 years; clerk. Two years previous to report had "bronchitis," followed in four months by pneumothorax with effusion on the left side; apex-beat of heart at right nipple; temporary improvement for six months, then dyspnea, fever, and bulging of the left side. Pulsation, from displaced heart, seen and felt in fourth and fifth and felt also in sixth right interspaces. In the sixth, seventh, and eighth interspaces, in the left mid-axillary line, there was a pulsation, synchronous with the cardiac systole, scarcely visible but quite marked on palpation. Diagnosis: pulsation, pleural effusion, probably purulent; diagnosis verified by aspiration with hypodermic needle. Impossible to find any sign of pneumothorax at this time. Aspiration of 2800 grammes. Heart returned to normal position; rapid convalescence; pericardium adherent; extracardiac systolic murmur at apex. Aspirated fluid contained caseous masses, fibrin cells, polynuclear leucocytes disintegrating. No special bacteria found.

No. 72. Another case was referred to by Osler in the discussion which followed the reading of Wilson's paper. Concerning this case he has communicated to me as follows: The patient was a girl, aged 19 years, admitted to the Johns Hopkins Hospital for malaria. Pleurisy following abdominal section for supposed tumor (movable spleen). Pulsation in left side from clavicle to fourth rib, and from sternum to anterior axillary fold, synchronous with cardiac systole, forcible. Heart pulsating to right of sternum; aspiration of serous exudate, with disappearance of abnormal pulsation and recovery. Two weeks

[1] Transactions of the Association for 1893; Medical News, Vol. LXIII, No. 3, July 15, 1893.
[2] Ann. Univ. di Med. Chir., Milano, Vol. CCXXXII, Fasc. 696, 1875, 385-391.
[3] Journal de Med. de Paris, t. IX, No. 1, 1885, 25.
[4] Bull. et Mém. Soc. Méd. des Hôp. de Paris, No. 19, May 31, 1894, p. 339.

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later returned on account of abdominal disorder. Operation: strangulated and necrotic spleen removed; good recovery.

This brings the total number of recorded cases up to seventy-three. It is more than probable that other cases have been reported to which reference could not be found, and that still more have occurred but have been overlooked.

We learn from Wilson's tables that of the fifty-two cases in which the sex was stated, forty-one were males. We are not surprised, therefore, to have at least three of these last five cases occur in males.

The age was found to vary from 2 years to 57 years, with the greatest number between 21 and 25. Our additions fall between the limits. As of the sixty-eight cases sixty-one are known to have been on the left side and only five on the right side, we anticipate all of these latest cases occurring on the left side. None of them, however, were of the nature of *empyema necessitatis*, a rather surprising fact when we learn that of the sixty-seven cases in which this point was mentioned, thirty-seven were of this variety, twenty-eight were intrapleural, and "in two cases both varieties were present."

In one of our five additional cases the fluid was serous, while in only one of the previous sixty-eight is it stated that the fluid was of this nature. This point, however, was overlooked in the reporting of twenty-seven cases.

All of these five cases occurred on the left side. Of the sixty-eight cases collected by Wilson, five were on the right side, sixty-one on the left, and in the remaining two the side affected is not mentioned.

It may be taken for granted that no bacteriological studies of the pleural contents were made in the earlier cases, and if made in the more recent ones, the published reports do not state the fact. It is, therefore, of double interest that such an examination was made in my own case, and with such satisfactory results. Though the child was very ill when the resection was performed, the demonstrated presence of the pneumococcus made it possible to hold out a more favorable result than we could otherwise have done.

It is to be regretted that we are not assisted by these additional cases in clearing up the pathological conditions which give rise to pulsations in certain pleural effusions. One thing, however, seems almost proven, and that is, that pneumothorax is not a necessary factor. There have now been three cases recently reported in which this condition was especially looked for, but with negative results.

I had believed intrapleural pressure to be the most important factor. But the fact that in my case the withdrawal of 400 cubic centimetres of fluid did not cause a cessation of the pulsation, seems to disprove this idea.

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MEMORANDA.

CONTRA-INDICATIONS TO THE USE OF ANTITOXIN IN DIPHTHERIA.

In the June issue of the University Medical Magazine reference is made to an article by Fischer (*Medical Record*, April 6, 1895), in which he points out the contra-indications to the use of antitoxin in diphtheria.

First in his list, he enumerates "cases of mixed infection; cases of scarlet fever complicating diphtheria, and cases of measles complicating diphtheria."

My experience in the use of antitoxin in a single case in which diphtheria and scarlet fever existed coincidently was so satisfactory, I feel that it is well worth recording,—especially as it is at direct variance with the above suggestion of Fischer.

Carrie M., aged four years, always healthy until I saw her February 6, 1895.

At that time she complained of her throat, headache, and pain in the stomach. Her temperature was 100° F., pulse 120.

Physical examination revealed a highly congested condition of the tonsils and surrounding parts, also a thin white coating over the right tonsil,—a similar condition was present on the left but was less distinct.

No clear diagnosis was made out, but diphtheria was suspected. The patient was given acetanilide, gr. ii., to control the fever. At 7 P.M. the throat symptoms were more clearly defined, in fact, distinctly diphtheritic. At the same time a slight rash began to show itself over the chest and neck. The temperature at this time was 101° F., pulse 130. Diagnosis: diphtheria and scarlatina. The same treatment was continued. On the following morning the symptoms were all aggravated. Temperature 102½° F., pulse 160. The left tonsil was completely covered by diphtheritic membrane, and the right partially covered. Parotids hard, swollen, and painful. Scarlatinal rash over the entire body. The antitoxin, which had been ordered, not having arrived the treatment was continued at 7.30 P.M., Dr. Burleigh saw the case with me. All of the symptoms were aggravated. Temperature 103° F., pulse 180. Diphtheritic membrane completely covered both tonsils. Scarlatinal rash still present over entire body. Twenty-five cubic centimetres of antitoxin were injected in the inter-

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scapular region. Twelve hours later the temperature was 100° F., and the pulse 130. There was not much change in the condition of the throat, but the child was somewhat brighter and had some appetite.

Twelve hours later the temperature was normal and the pulse 100. The diphtheritic membrane was seen to be melting away and the rash gradually fading out. The child was much improved in every way. Recovery was prompt and complete, thirty-six hours after the serum was injected the membrane was completely gone.

The interesting point, here, of course, is in reference to the effect of antitoxin upon the scarlatina.

There were certainly no untoward symptoms. I think that had the case been one of simple scarlatina, I would not have expected to find the throat clear up as promptly as it did in this case.

I should be glad to hear reports from other similar cases.

GILLIFORD B. SWEENY.

HORNE BUILDING, PITTSBURG, PA.

BERIBERI AGAIN.

THE "Daniel Barnes," from Cebu, Philippine Islands, with a full cargo of hemp, 9000 bales, 2150 tons, arrived recently at the Delaware Breakwater, with a number of men, including the captain, sick of beriberi. She is docked now at East India wharves, Brooklyn. One-third of her cargo is unloaded. I have visited this ship, and ascertained that she had an European crew, that the cargo, on the voyage, sweated, as hemp always does, and "gave forth fumes when she struck, a couple of months ago, that spell of very cold weather." The top layer of the bales mouldered in consequence of the fermentation. The master of the wharves told me the appearance of a hemp-carrying ship with beriberi on board is by no means of rare occurrence, and that the loss of merchandise, brought about by sweating, is from 1 to 2 per cent. He mentioned two other ships, one a sugar the other a hemp ship, the captains of both vessels, being Yankees from Maine, died of beriberi at sea. This again points to carbonic acid as the cause of beriberi.

ALBERT S. ASHMEAD, M.D.

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ALUMNI NOTES.

DR. GEORGE DOCK, Class of 1884, Professor of the Theory and Practice of Medicine and of Clinical Medicine in the University of Michigan, Ann Arbor, addressed, by invitation, the Alumni Association of the Harvard Medical School, on the subject of "medical education" on June 25. A dinner followed at the Hotel Vendome. At the Commencement Exercises the degree of A.M. was conferred on Dr. Dock.

A FURTHER ENDOWMENT OF $5,000,000 NEEDED BY THE UNIVERSITY.

THE Provost, Mr. C. C. Harrison, has addressed a letter to the friends of the University, urging the further endowment of the institution with $5,000,000. This amount is needed to enable the University to keep in the front rank in the educational world. Both Columbia College, New York, and the University of Chicago have received large endowments within the past few years. Without the necessary funds, the work of any such institution must necessarily be very much hampered.

It is hoped that the friends of the University of Pennsylvania will not allow the present opportunity for taking an advanced position to pass by for want of sufficient endowment. Some of the needs of the institution the Provost has detailed. They are as follows:

"We need scholarships for needy and deserving students, and fellowships to enable the best of our young men and women, who are studying to become teachers, to complete their training in graduate work before going into the schools. We need research laboratories, and the means to conduct them, because, while human life is largely dependent upon such work, it always brings large money loss to the University. It is the most expensive part of University work, and one of the most important.

"We greatly need to increase in every direction our library facilities. We could economically spend in books, to-day, $250,000.

"We have no University chapel; no building for our graduate work; none for our Law School; none for our School of Architecture; no Physical Laboratory; no University Gymnasium; we have no publication fund.

"The new dormitory system, through which we hope to provide

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in much better ways than ever before for the daily life of the student, will alone cost $1,000,000.

"The new hospital buildings of the University, too, will soon be ready for patients, and will need a generous public to help maintain them."

As stated in the letter referred to, money given to a great university is always, so far as history shows, safely and well-expended. Universities are younger the older they grow.

A Gift of $50,000 to the University.

Mr. Thomas McKean has announced to the Board of Trustees of the University of Pennsylvania that he had contributed $50,000 towards the fund of $5,000,000 which it is proposed to raise for the needs of the institution. The gift is without any restriction.

A Gift of $10,000 to the University.

Richard F. Loper contributed $10,000 to name a house in the new dormitory system of the University of Pennsylvania.

The Pathology of Tabes Dorsalis.

From a careful study of one old case of pure tabes, two recent cases of tabes associated with general paralysis, and one pure case of general paralysis, Nageotte concludes that the primary lesion of tabes consists in an intense perineutritis, involving the posterior root between the ganglion and the entrance of the root into the arachnoid cavity. At first proliferative, this perineutritis at a later stage becomes fibrous, and is followed by degeneration of the fibres of the posterior roots. The anterior roots are involved equally with the posterior, but the former more effectively resist the interstitial changes than the latter. Nevertheless, indications of this lesion are found in the peripheral neutritis of motor type observed in some cases. The morbid changes in the nerve-roots are identical with those observed in the brain in general paralysis. There is no historic evidence to prevent acceptance of the belief that in both instances the lesions are of syphilitic origin.—*La Semaine Médicale.*

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EDITORIAL.

THE RESULTS OF DOUBLE CASTRATION IN HYPERTROPHY OF THE PROSTATE.

It has been just two years since castration was proposed by Dr. J. William White for the relief of senile enlargement of the prostate gland. The arguments that led to the recommendation of the operation appear in full in the original paper published in the *Annals of Surgery* for August, 1893. Since this time, numerous contributions on the subject and reports of cases have appeared in the medical journals of this country and Europe, which have now placed the matter well before the profession.

In a paper on "The Results of Double Castration in Hypertrophy of the Prostate," read before the American Surgical Association, May 28, 1895 (*Annals of Surgery*, July, 1895), Dr. White reviews the subject in the light of the experience of the past two years. The paper is divided into three portions: (1) a theoretical; (2) a clinical; and (3) an experimental. Naturally, the most important part of the work is that which refers to the results obtained. Scarcely less interesting is the theory advanced by the author, which, while he admits it to be insusceptible of demonstration at the present time, if accepted, would explain the etiology of prostatic hypertrophy, and at the same time would account for some of the clinical features of the growths and the beneficial results that follow castration in these cases.

This theory concerns the possible connection between the prostatic hypertrophy and testicular changes coming on with advancing years. Griffiths has pointed out that the function of the testes is twofold,—viz., (1) to control and determine the development of the characteristics of the male sex; and (2) to produce spermatozoa for the reproduction of the species. Although these two functions are usually exercised together, Dr. White remarks that "there is abundant evidence to show that the testicles may lose, or may never have had, the sperm-producing power and still possess the quality which enables them to hold the organism in its normal groove and to invest it with the full attributes of masculinity." This fact indicates, as Griffiths has stated, that the production of spermatozoa is the more specialized property, and is therefore attained with more difficulty.

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The manner in which the testicles influence the growth of the body, whether as an ordinary reflex through the nervous system or by means of a substance produced by the seminal cells and absorbed into the system, which, by influencing the nerve-centres or in some other way controls growth and nutrition, is uncertain. The influence of the thyroid gland is undoubtedly exerted in the latter manner, inasmuch as the condition, myxedema, which results from the loss of this control, is markedly benefited by the internal administration of the gland. The effects noted after the injection of testiculin in some instances would seem to indicate a chemical influence in the case of the testes.

In whatever manner this function is performed, when the individual reaches the full development intended by nature it is probable that this controlling influence ceases to exist; the testicles are then concerned only in the production of spermatozoa, but they would probably still have a marked effect on all the accessory sexual organs. A larger opportunity would, therefore, be afforded for aberration in the growth and structure of the tissues involved. From these premises Dr. White concludes that "the disappearance of the necessity for a given product without the coincident disappearance of the vital energy which was expended in producing it might conceivably result in hypertrophy of organs intimately associated with those which were the source of supply."

The results of the operation have been very gratifying. Of 102 cases in which the condition of the prostate was noted, some distinct decrease in size is described in 65 or 63.7 per cent., while in 24 additional cases (87 per cent. in all) the improvement in the symptoms renders the conclusion justifiable that the prostate had become smaller. Among other favorable phenomena noted are ability to urinate (66 per cent.), ease of catheterism (about 75 per cent.), and disappearance of previously intractable cystitis (about 52 per cent.).

The cases included in the table have been grouped according to the time of reporting as follows:

(1) Those reported immediately after the operation,—*i.e.*, within the first two or three weeks, and from which nothing further has been heard; these number 7 (8.7 per cent.).

(2) Those in which from a month to three months elapsed before the patient passed from observation and in which the prostatic changes and the improvement in symptoms were carefully noted; these number 16 (20 per cent.).

(3) Those observed after three months, and in which the local changes seem to have reached their culmination, and the health of the patient appeared to be perfectly re-established. These were 57 (71.3 per cent.).

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It will be seen from this, that in most instances, the reports have not been made until sufficient time has elapsed after the operation to fully test the measure, and the permanence of the beneficial results obtained.

The number of deaths recorded in the table is out of all proportion to the gravity of the operation *per se*, and is due to the fact that cases have been operated upon that were already fatally poisoned by the failure of the renal function and the septic condition of the bladder and kidneys; they were cases that were rapidly progressing towards a fatal issue and the removal of the testicles simply failed to avert the inevitable termination. If the cases be eliminated in which the death was clearly not chargeable to the operation, the mortality of those tabulated would be 7.1 per cent.

This rate is certainly much higher than it will be when the operation is restricted within the proper limits.

It is probable that suprapubic prostatectomy will come more in competition with castration than any other operation. It will, therefore, be interesting to compare the two. The author believes that the advantages are in favor of the latter and justifies his position in the following: (*a*) The mortality of the first extensive series of suprapubic prostatectomies published was 25 per cent. The mortality of my table of a slightly larger number of cases is 18 per cent., including every known death, even when it occurred months after operation. The true mortality, as I have already said, I believe to be about 7 per cent. The death-rate will be lower in the future in both operations, but the proportional difference in favor of castration will probably persist or increase, as castration is a simple, easy, rapid procedure, without danger *per se*, and requiring for its safe performance only a proper selection of cases. It seems to me not unfair to add that in the present instance the facts have been obtained largely by personal solicitation, and that unfavorable cases have not been suppressed. (*b*) The return to local and general health in the successful cases has been more complete and vastly more rapid than after prostatectomy. A re-establishment of almost perfect health appears to have occurred in fifty-one cases (51 per cent.) within from four to twelve weeks. (*c*) Vesical contractility was re-established, cystitis disappeared, and all pain ceased in such a large proportion of the successful cases that it seems unlikely that any operation which opens the bladder and necessitates healing by granulation will secure equivalent results; certainly suprapubic prostatectomy has not yet done so. (*d*) A permanent fistula may follow suprapubic prostatectomy and prove a continual source of annoyance even when all the other results have been favorable. (*e*) It is too soon yet to compare the relative danger of relapse. Although more than 70 per cent.

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of the cases of castration in the table had been observed for over three months, in not a single one did relapse occur.

The striking analogy, to which Dr. White has called attention, existing between uterine fibroids and prostatic hypertrophy, and the indications for oöphorectomy and orchectomy in the respective conditions is very forcibly impressed by the results obtained from the two operations.

"As to the results of oöphorectomy for myomata," Greig Smith says, "we may, in every thirteen cases of recovery after operation, reckon upon complete cure,—*i.e.*, shrinking of the tumor and menopause in ten cases, improvement in two, and failure in only one." An analysis of the table of castrations shows that, upon the same bases, "we may, in every thirteen cases of recovery, count upon eleven being complete cures in the sense of shrinking of the tumor, one being improved, and one being unsuccessful."

A careful study of the paper shows that the beneficial results of the operation in proper cases is rather understated. The theoretical objections which have been raised by a few, who have had no practical experience with the operation, are fully answered by the table, which contains reports of over one hundred operations by upward of fifty surgeons, most of whom are among the most competent of medical observers, and whose judgment and honesty entitle their reports to every credence.

Even the lowest mortality given (7 per cent.) does not represent the mortality of castration, as it is well known that this operation has a very low mortality, but of castration in the presence of the serious complications frequently attending the advanced stages of enlargement of the prostate,—viz., cystitis, diseased kidneys, etc.

The experimental portion of the paper includes the results of unilateral castration, ligature or section of the vas deferens, ligation of vascular structures of the cord, and ligation or section of the entire cord.

The evidence regarding the value of unilateral castration is contradictory, and no safe deductions can be drawn at the present time. Ligature or division of the vas on both sides in dogs was, in nearly every case, followed by atrophy of the prostate, without causing much change in the testicles. These observations are interesting and invite further study. Ligation of the vascular constituents of the cord, or of the cord itself, produces atrophy of the prostate, but at the same time causes disorganization of the testis. Dr. White's conclusions appear in full on page 873 of this issue of the MAGAZINE.

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MEDICAL PROGRESS.

MEDICINE.

UNDER THE CHARGE OF

WILLIAM PEPPER, M.D., LL.D., AND JAMES TYSON, M.D.,

ASSISTED BY

M. HOWARD FUSSELL, M.D.

A Case of Tetany treated by Thyroid Extract.

Brumwell (*British Medical Journal*, June 1, 1895) reports a case of operative tetany which was practically cured by the administration of large doses of thyroid extract. He also cites a case of idiopathic tetany in a boy of 8 years, who had several attacks during the winter following in spite of large doses of chloral and bromide. He was put upon powdered thyroid extract and did remarkably well, and within two months was apparently cured. The case is reported in order to call attention to what appears to the author to be a cure.

Duplex Personality.

Mason (*Cincinnati Lancet Clinic*, June 8, 1895), after citing several cases of dual personality and other facts in hypnotism, concludes,—

(1) That there exists, probably in each one of us, a sublimal self or second personality which is able to act at great distances from the physical body, and which is endowed with perceptive powers far exceeding those of the primary self.

(2) That clairvoyance is an attribute of the sublimal self, and in that view is perfectly reasonable and natural.

(3) That hypnotism is a means of experimentally bringing this sublimal self, with its added powers, into action.

Adenoid Growths in Children.

Smith (*Lancet*, May 25, 1895) calls attention to the well-known derangements caused by adenoid growths in the naso-pharynx.

They are frequent in infancy. An infant with large growths will frequently sleep with mouth closed, and will not snore. The growths should be suspected if the bridge of the nose is broad and faintly dimpled at the upper border of the lateral cartilages. Depressions of the inframammary regions and depressions of the ensiform owe their origin usually to post-pharyngeal growths. Snuffling, when not due to syphilis, has its cause in these growths, and this snuffling and coryza may persist for a very long time and closely resemble the syphilitic condition, but the edge of the nares is moist, not crusted nor cracked as in that disease.

A rare symptom is a loud inspiratory crowing. It is very loud, especially during sleep. This crowing is always due to the growths.

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The mammary retraction is due to collapse of the lower lobes of the lungs at the anterior part. This collapse is only temporary, but ends in small, ill-used lungs. The nervous symptoms are often the most marked of all, reflex spasm of larynx is very common. General convulsions, asthma, and nocturnal incontinence are some of the other well-known symptoms. Deafness is also a well-known frequent symptom. In all nervous children where there is any overgrowth of the tissue an operation for its removal is indispensable to its improvement.

Trional as a Hypnotic.

Spitzer (*Wiener klinische Wochenschrift*, No. 23, 1895) believes this substance is not only an excellent hypnotic in the different psychoses, but is used with benefit in patients sick with lung- and heart-disease.

Sleep is produced quickly after the administration of the drug and continues during the following hours. In some cases there is a tendency to sleep during the next day, especially in the morning.

In none of his cases could he discover any detrimental action on the heart or lungs. He has noticed in some cases a slight disturbance of the digestive tract, but believes it was only an idiosyncrasy.

He believes it approaches morphia in its effects and may often be substituted for it.

Treatment of Empyemata in Children.

Cantley (*International Medical Magazine*, June, 1895) thus summarizes a study of eighty-six cases of empyema in children:

(1) When pus is found to be present in the pleural cavity, the proper treatment is to remove it.

(2) The best method to adopt for its removal is simple incision and drainage.

(3) The best site for the operation is the fifth space in the mid-axillary line.

(4) Irrigation is unadvisable, and is indicated only in cases of fetid effusions.

(5) Exploration and scraping of the cavity are not necessary.

(6) Resection of rib is practically never necessary in children as a primary procedure to procure efficient drainage.

(7) Collapse of the chest wall is not a result to be desired in the early stages of the treatment.

(8) Resections of the rib may be necessary to secure the closure of the sinus, subsequently by allowing the chest wall to fall in.

(9) Rapid and complete expansion of the lung is the great object of treatment.

(10) The tube must be removed early.

Leucomaine-Poisoning.

Rachford (*Medical Record*, June 22, 1895), after considerable study of the question, believes that he is justified in asserting that leucomaine-poisoning is a very important phase of auto-intoxication, and that it may manifest itself in at least three clinical forms: (1) As a true migraine or leucomaine headache. (2) As a migrainous epilepsy or leucomaine epilepsy. (3) As a migrainous gastric neurosis or leucomaine gastric neurosis. Paraxanthin is by far the most poisonous of all leucomaines. He notes the following facts: (1) Paraxanthin and xanthin are

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poisonous leucomaines of the uric acid group, capable of producing the most profound nervous symptoms. They are readily soluble in water, urine, and blood. (2) Paraxanthin is found in normal urine in such small quantities that its poisonous properties are lost in dilution. He has always failed to find paraxanthin in four litres of normal urine; he hence concludes that paraxanthin is present in abnormally large quantities if it can be demonstrated in four litres of urine. (3) Paraxanthin and xanthin are not formed in the kidney. They are excreted from the blood by the kidney.

He then describes the following cases:

CASE I. *Migraine.*—Mrs. M., aged 35 years. A number of sisters and brothers have had migraine. Her attacks were ushered in by a slight burning in one cheek. An attack may occur every week, or a severe attack may be followed by a prolonged interval of health. The urine during and immediately after an attack always contained paraxanthin and xanthin.

CASE II. *Migrainous Epilepsy.*—Mrs. X., until September, 1892, always had "sick headache," since that time she has had no sick headache, but has had epileptoid attacks. These attacks are as follows: Sudden in onset; muscles rigid but not convulsed; labored, gasping, irregular breathing, unconsciousness from beginning to end of the attack; heart's action rapid, but regular and strong; the urine always contained an excess of xanthin and paraxanthin. The case was treated with one-grain doses of permanganate of potassium three times a day, and there have been but two attacks since.

CASE III. *Gastric Neurosis.*—Mrs. P. always suffered from sick headache until five months ago, since when she has had no headache, but attacks of severe abdominal pain and vomiting. The urine always contained an excess of paraxanthin and xanthin during these attacks.

AN EPIDEMIC STOMATITIS.

ALBERT (*La Semaine Médicale*, June 15, 1895) reports an epidemic of benign stomatitis in an artillery corps of the French army. There is a marked desquamation of the labial mucous membrane, both superior and inferior, with commissural fissures and red worm-like patches on the palate. These plaques bleed easily. They begin on the inferior lip and inoculate the superior by contact. An inoculation was entirely unsuccessful.

RENDERING OF ANIMALS IMMUNE AGAINST THE VENOM OF THE COBRA AND OTHER SERPENTS.

FRASER (*British Medical Journal*, June 15, 1895) gives the results of some interesting experiments with the venom from different serpents. That of the cobra was most largely used, though rattlesnake-poison gave the same results as did the venom from the brown and black snake of Australia. The lethal dose was first found using guinea-pigs, rabbits, cats, and harmless snakes as subjects. It was found that the action of the poison was twofold,—the action on the general system and the local action.

In immunizing animals it was found that the action on the functions was much more quickly and easily controlled than the local action. It was found after many experiments that rabbits could by the use of gradually increasing doses become accustomed to twenty, thirty, and forty times the minimum lethal dose. The duration of immunity has not been definitely determined, but large

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doses have been given as long as twenty days after immunization with no effect whatsoever.

The blood-serum of immunized animals was used to give protection to animals from lethal doses of the poison. To this serum the term *antivenene* is applied, and the experiments proved positively that this antivenene is able in varying conditions of administration to perfectly prevent lethal doses of the venom of the most poisonous animals from producing death in unprotected animals.

It is proposed to carry on experiments and obtain the antivenene in large quantities in order that its applicability to the cure of snake-bite in man may be tested in India, where there is an annual mortality of 20,000 from this accident.

The Pathogenesis of Gout.

Levison (*Zeitschrift für klinische Medicin*, Vol. xxvi, Parts 3 and 4, 1894) endeavors to answer the two questions: (1) What is the origin of uric acid, and what is its physiological significance? (2) Why does the blood of gouty individuals contain a greater quantity of uric acid than does that of healthy individuals, and what relation do diseases of the kidney bear to gout? He cites a number of experiments in support of the theory that uric acid is produced by the oxidation of albuminous substances, especially nuclein in the body, and that the production of uric acid is increased or diminished by all factors (disease, medicines, poisons, etc.) which cause a quicker or slower destruction of the cellular elements of the body, particularly the leucocytes, and that therefore the production of uric acid is in direct proportion to the number of leucocytes destroyed during a given time. These investigations were carried on on new-born infants and on patients suffering with pneumonia, leukemia, etc. The theory seems to hold good in such patients, but not in those the subject of disease of the kidney, especially of granular atrophy of the kidney and gout, in whom there occurs no leucocytosis. The explanation must be sought elsewhere. At the autopsy the joints of forty-two persons the subject of kidney-disease were examined. In twelve cases uric acid deposits were found in the joints; in thirty cases not. In all cases in which it was found, the kidney was in a state of granular atrophy. His conclusions are,—

(1) Arthritis uratica is much more common than is usually supposed, and workers in lead are particularly liable to it. In all individuals subject to the poisonous influences of lead, and who have developed the symptoms of granular atrophy of the kidney, one must expect to find uric acid deposits in the joints, whether or not they have had regular attacks of gout or suffered with any joint pains.

(2) At the autopsy on gouty subjects one finds constantly the kidney in the condition of granular atrophy,—"gouty kidney."

(3) It is highly probable that the primary factor in the production of the uric acid deposits is the uric acid retention caused by the granular atrophy of the kidney, while the further development of the arthritis and the localization of the deposits are dependent upon other partly unknown circumstances. In other words, the granular atrophy of the kidney is not alone the constant accompaniment of the arthritis, but is to be looked upon as a condition necessary for its development.

The Regularity of the Pulse-Rhythm in Health and in Disease.

Hüsler (*Deutsches Archiv für Medicin*, Vol. liv, Parts 2 and 3, 1895) relates the results of his sphygmographic study of the pulses of 105 individuals, ranging from 17 to 35 years of age. His investigations are of four sorts:

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(1) Pulse-rhythm in health.
(2) Pulse-rhythm after acute diseases.
(3) Pulse-rhythm in chronic and other diseases.
(4) Pulse-rhythm in disease of the circulatory apparatus.

His conclusions are: The regularity of the pulse is only relative. The normal heart shows in the sequence of its pulsations in almost all cases rather remarkable differences, which at present cannot be explained by external factors. These differences are such that a limit for the physiological pulse-rhythm cannot now be defined. On the other hand, the heart, excluding the differences observed with a normal heart, shows a great tendency to maintain its rhythm. Even severe general diseases or marked disturbance of the cardiac valvular apparatus have generally no influence on the pulse-rhythm. In order that arhythmia be observed, certain partly unknown toxines must exert their injurious influence on the cardiac mechanism.

The Results of the Serum Treatment of Diphtheria.

The views regarding the serum treatment of diphtheria as expressed by various physicians at the meeting of the "Dreizehnte Kongress für innere Medicin," held in Munich, April 2–5, 1895 (*Centralblatt für innere Medicin*, No. 21, May 25, 1895).

Heubner (Berlin): The percentage of recoveries of 3000 collected cases treated with the serum was 80 per cent. Personally he treated 207 cases, of which 26 were complicated, 181 pure. The mortality of the 207 cases was 13 per cent., of the 181 cases, 10 per cent. Following the injection of the serum he noticed an interesting change in the fever curve; a very evident increase in the rapidity of the casting off of the false membrane; no unfavorable influence regarding the albuminuria; no implication of the larynx in cases in which, previous to the administration of the antitoxin, the larynx had been free; rapid cleansing of the air-passages in cases in which they were affected. In 9 of the 181 cases, operation was rendered unnecessary, although at the beginning of treatment symptoms of larynx stenosis were already present. In 5 cases, the serum exerted no influence. Relapses occurred in 1.6 per cent., paralysis in 7.4 per cent. of the cases. The serum produces no injurious effects, does not cause nephritis. Sixty-four sick children were injected for immunization; 2 contracted diphtheria six weeks later; 1, a weakly child suffering with chronic pneumonia, died. Because of a few unfavorable experiences one may not argue that the serum therapy is without value.

Baginsky (Berlin): The mortality of cases treated without the antitoxin was 41 per cent.; of 525 cases which he treated with it 15 per cent; of cases, immediately following these latter ones, treated without the serum 51 per cent. The serum causes an improvement in the general condition which begins on the second or third day following the commencement of the treatment; a lowering of the temperature; a cessation of the local process. Larynx stenosis does not occur when the larynx is free at the commencement of the treatment; intubation is rendered much easier and seems to have entirely replaced tracheotomy. The number of deaths from heart-failure is decreased, and in those cases which do go to necropsy there seems to be a diminution of myocarditic changes. There is no particular effect exerted on the kidney. The number of paralysis seems to be increased, probably because more children live. The mortality is less the sooner the treatment is begun. Local abscess was observed once; polymorphous exanthema often. It is difficult to give a proper estimate of the value of immunization procedure.

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WIEDERHOFER (Vienna): By the antitoxin serum, the course of diphtheria is modified in a remarkably favorable manner.

RANKE (Munich) treated ninety-six cases, of whom sixty-three had laryngo-stenotic symptoms on admission to the hospital. Following the injection of the antitoxin twenty-one improved greatly; forty-two were intubated, of whom thirteen died. Ranke believes that the duration of the intubation is shortened, and that the serum has a tendency to prevent the spreading downward of the diphtheritic process.

KOHTS (Strassburg): Statistics of previous six years: treated 841 patients; mortality 32.58 per cent. Tracheotomized 491, mortality 44.4 per cent. (single years 25 to 50.4 per cent.); not tracheotomized 350, mortality 16 per cent. (single years 6.9 to 17.8 per cent.). With these latter are included all patients dying when admitted to the hospital, and those whose diphtheria was complicated with measles, scarlet fever, tuberculosis, sepsis, etc. Of 100 patients tracheotomized between October 1, 1893, and July 1, 1894, only 16 were admitted on the first or second day of the disease. Of those admitted on the first day, all (6) recovered (100 per cent.); of those admitted on the second day (10) eight recovered (80 per cent.). The result—without serum treatment—is the better the sooner the patient comes under observation. From November, 1894, to March 26, 1895, 80 patients were treated, 47 with Behring's serum, 33 by other methods (during the last week of this period, very severe cases received also injections of No. II or III). Of these 33, 15.75 per cent. died. All of those not operated upon recovered. Of the 47 patients, 23.4 per cent. died; of those tracheotomized 29.41 per cent.; not tracheotomized 7.6 per cent. Kohts, however, thinks that the serum exerts a favorable influence over the local process, but does not render local treatment unnecessary. The results of treatment with and without the serum do not differ in cases in which either treatment is begun on the first or second day of the disease.

GRAWITZ (Berlin) directed attention to the blood-thinning effects of intravenous and subcutaneous injections of serum, and thinks that the serum as such —without antitoxin—may exert a favorable influence on the course of the disease, and that the possibility of this should be determined clinically.

SEITZ (Munich) stated that there were no injurious effects to be observed after the injection of the antitoxin; no increase in the albuminuria even when marked nephritis was present; only exanthemata occur more frequently.

STINTZING (Jena) directed attention to the apparent mildness of the epidemic during which he treated fifty-nine cases with the serum. Of these 20.3 per cent. recovered. Of fifty-nine cases treated otherwise immediately before he began to use the serum 25.4 per cent. recovered. Years must elapse before a positive opinion can be given.

TRUMPP (Graz) drew attention to some of the peculiarities of the diphtheria bacillus, and mentioning methods of disinfection, remarked that immunization by injection of the serum was the only sure preventive.

RAUCHFUSS (St. Petersburg) reported 116 cases treated with the serum; mortality 28 per cent. Previous mortality 55 per cent. Observed, following injections of the antitoxin cessation of the local process, improvement of the general condition, diminution of the fever. Increase of myocarditis and nephritis was not observed. Polyarthritis as result of the serum therapy occurred once.

TREUPEL (Freiburg) related the results of his experiments on rabbits. Following the injection of the serum albuminuria may occur, but tube-casts, blood-corpuscles, renal epithelium could not be found.

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SIEGERT (Strassburg), experimenting on rabbits and dogs, found that subcutaneous and intravenous injections of the serum may be followed by a transitory albuminuria, but does not, therefore, conclude that the same thing would occur in man.

HAHN (Berlin) remarks that one must determine what is the result of the action of the antitoxin, and what the result of the action of the albumose.

MERING (Halle) noted the remarkable decrease in the mortality and the absence of all injurious effects following the use of the antitoxin.

VIERORDT (Heidelberg) thought that the epidemics in various places might differ in severity, and ascribed some of the good results following the use of the serum to the greater care bestowed upon other details of treatment, as feeding, etc.; but was of the opinion that extended investigations were needed.

JAKSCH (Prag) drew attention to the fact that the occurrence of albumose in the urine is a symptom of severe infectious disease, especially of diphtheria.

HEUBNER'S conclusions: (1) No one has drawn particular attention to the occurrence of injurious effects following the use of the antitoxin. (2) All observers who have had much experience have noticed a great decrease in the rate of mortality. (3) The manner in which the serum operates, and to what extent it possesses immunizing powers, must be demonstrated later. (4) The further use of the serum is an obligation.

SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

ASSISTED BY

G. G. DAVIS, M.D., M.R.C.S., AND ELLWOOD R. KIRBY, M.D.

THE EFFECTS OF DOUBLE CASTRATION UPON HYPERTROPHY OF THE PROSTATE.

WHITE (*Annals of Surgery*, July, 1894), in studying the theory of the causation of enlarged prostate, states that the function of the testicles is twofold,—

(1) To control and develop the characteristics of the male sex.

(2) To reproduce the species.

These two functions are usually exercised together, but that the former may be exercised when the latter fails seems to indicate that the production of spermatozoa is the more specialized property. The whole genital system depends more or less upon the integrity of the testicles; they control the extent to which the remainder of the sexual apparatus grows. Williams claims that in the genesis of neoplasms two factors must be considered,—

(1) The cells, whence they originate.

(2) And the force that regulates the cellular activity.

He believes that every component cell of a multicellular organism has the inherent power of developing itself into the form of the parent organism, that the enormous reproductive power of the somatic cells has not been fully real-

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ized by pathologists, and that these powers are only held or restrained in the normal individual by a "force" which regulates the growth and development of the tissues and organs in relation to each other, and to the organism as a whole.

In some of the cases the author operated upon, living spermatozoa could not be found in the testicles at the time of removal, yet the effect upon the prostate was as marked as in the other cases. If the theory which the author has advanced be correct, such cases indicate the persistence, but perversion of part of the two-fold function of the testicles after the reproductive factor has vanished.

In the clinical part of the paper the author answers the theoretical objections to the operation which have been raised.

(1) That the operation should not be considered a physiological experiment, because the cut sections of the gland show the characteristic atrophic changes even a few days after the operation.

(2) That the reported successful cases prove that the same results could not be brought about by rest in bed, catheterization, etc. Many of the cases are described in detail by the author, and show that the various palliative measures had little or no effect.

(3) That the subsidence of the symptoms is largely due to the disappearance of edema and congestion. This may be explained by Thompson, upon the fact that the middle lobe is largely made up of the glandular elements; and as it has been shown by Griffiths and Kirby that the glandular tissue first atrophies, it would be but reasonable to suppose that a very little diminution in a growth largely adenomatous, and occupying this position, would be at once attended with an amelioration of the symptoms.

(4) The disappearance of cystitis in 52 per cent. of the cases is surprising, but as the prostatic plexus of veins receives nearly all the return blood-supply from the bladder, any backward pressure on these from the blood column inevitably produces swelling and congestion of the vesical mucosa. Guyon and Albarran have shown that septic infection of a healthy mucous membrane by the pyogenic microbes of acute and chronic cystitis is not possible.

(5) The bladder regained its normal power in 66 per cent. of the cases, some of which were of long standing, which shows that Thompson's assertion that after two years' use of the catheter the return of voluntary power is impossible.

(6) The possibility of operating in the presence of an undetected calculus does not seem a very grave objection to the operation, as the most unfavorable subjects for operation for vesical calculi are the advanced prostatics with cystitis. If castration will mitigate the vesical inflammation and wholly or partially obliterate the postprostatic cul-de-sac, it will certainly be deliberately adopted as a primary operation by many surgeons.

In conclusion, the author makes the following summary:

(1) The function of the testis, like that of the ovary, is twofold,—the reproduction of the species, the development and preservation of the secondary sexual characteristics of the individual. The need for the exercise of the latter function ceases when full adult life is reached; but it is possible that the activity of testicles and ovaries does not disappear coincidently, and that hypertrophies in closely-allied organs, like the prostate and uterus, are the result of this misdirected energy.

(2) The theoretic objections which have been urged against the operation of double castration have been fully negatived by clinical experience, which shows in a very large proportion of the cases (87.2 per cent.) rapid atrophy follows the operation, and that disappearance or great lessening in degree of long-standing cystitis (52 per cent.); more or less return of vesical contractility (66 per cent.),

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and a return of the local conditions not very far removed from the normal (46.4 per cent.) may be expected in a considerable number of cases.

(3) The deaths have been twenty in one hundred and eleven cases (18 per cent.); excluding those cases which died from uremia alone the mortality is 7.1 per cent. It may be interesting to note that the desperate cases which make up the series of death showed improvement of symptoms or shrinkage of the prostate before they died.

(4) Comparison with other operative procedures seems to justify the statement that, apart from the sentimental objections of aged persons on the one hand, and the real, entirely natural, and very strong repuguance to the operation felt by the younger patients, castration offers a better prospect of permanent return to nearly normal conditions than does any other method of treatment.

(5) The evidence as to unilateral castration is at present contradictory, but there can be no doubt that in some cases it is followed by unilateral atrophy of the prostate, and in two cases at least it resulted in a very marked improvement of the symptoms.

(6) My experiments upon dogs have shown in nearly every case in which the vas deferens was tied or divided on both sides that, without much change in the testicles, there was beginning atrophy and progressive loss of weight of the prostate. These experiments need repetition and confirmation, as the absence of corresponding testicular changes seems to make results somewhat anomalous. It is possible that the exclusion or severance of small but important nerves may account for the effect upon the prostate.

(7) Ligation of the vascular constituents of the cord, or of the whole cord, produces atrophy of the prostate, but in my experiments only after first causing disorganization of the testicle.

The Radical Cure of Umbilical Hernia.

Lucas-Championnière (*Revue de Chirurgie*, 1895) advocates the radical cure of umbilical and epigastric hernia. Although such treatment is not so frequently applied to these as to other hernias, the indications for operation may be regarded as more urgent in the former.

Umbilical hernia usually attains an enormous size and causes much discomfort. It is never effectually retained by truss or bandage. It assists in bringing about rapid organic failure, marked by diabetes, albuminuria, and premature senility, and is almost always complicated by obesity and pulmonary emphysema. When the hernia has acquired a considerable volume it is no longer amenable to surgical treatment, as the swelling will very probably return through the large opening in the abdominal wall. In cases of small umbilical hernia a solid radical cure may be effected. As umbilical hernia presents itself in many forms, it is impossible to state absolutely the details of the operation for radical cure.

In this, as in other forms of hernia, the main objects of such treatment are to remove the sac, to secure its pedicle, and to close the orifice in the abdominal wall by sutures arranged in rows, so as to establish a firm cicatrix. In most cases in which the sac is removed it is necessary to excise the umbilicus.

In operating upon umbilical hernia the author usually removes a large mass of omentum, and thus by reducing the tension of the abdominal walls lessens the tendency to relapse.

The opening in the peritoneal cavity is to be closed by five rows of sutures, one for the peritoneum, one for the skin, and three for the different muscular layers.

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The author has operated eighteen times with good results, but in some of the more severe instances he had to contend with serious symptoms of pulmonary congestion.

He had also operated in eleven cases of epigastric hernia. This form of hernia, unlike umbilical, has hardly any tendency to increase in size. It is usually painful and often accompanied by vomiting.

The hernial orifice should be freely excised, and the sac drawn forward, opened, and detached from surrounding parts and removed together with any omentum it may contain. The pedicle of the sac should be ligated before division as far back as possible. The opening is then closed by three rows of sutures, one for skin, one for peritoneum, and a third for the intermediate portions of the abdominal wall. In the author's practice this operation has never been followed by a relapse.

Excision of the Vas Deferens for Prostatic Hypertrophy.

Pavone (*Il Policlinico*, June, 1895) has made a series of experiments upon dogs with regard to the effects of removing the testes or vas alone. He finds that bilateral extirpation of the vas brings about the same atrophy of the prostate as castration. Drawings were made from the sections of each operation, and when compared the changes were found to be the same. The author, therefore, recommends the excision of the vas in reference to castration, being a much simpler operation, causing less mutilation and less mental shock to the patient.

The Operative Treatment of Wry Neck.

Mikulicz (*Centralblatt für Chirurgie*, 1895), being dissatisfied with the results both of subcutaneous and open division of the sterno-mastoid in cases of wry neck, advocates almost the total removal of the contracted muscle, the posterior part of the upper extremity, where it is traversed by the spinal accessory nerve, being left. He has operated upon seventeen cases with success, the only bad results being the disfigurement of the neck caused by the absence of the muscle. Examination of the extirpated muscle in these cases has convinced him that wry neck is the result of a chronic inflammatory condition (myositis fibrosa) involving the whole of the sterno-mastoid muscle. This condition he attributes in congenital cases to compression of the muscle during a long, difficult labor than to laceration. The so-called hematomata of the sterno-mastoid sometimes observed in infants is not due to effusion of blood, but to thickening and induration of the inflamed muscle.

Incision and Drainage of the Pericardium.

Von Eiselsberg (*Wiener klinische Wochenschrift*, 1895) relates the case of a youth, aged 17 years, who received a punctured wound in the cardiac region. The wound gave no pain and was cured without medical treatment. One month later the patient began to suffer from dyspnea, cyanosis, edema, frequent, small, irregular pulse, increased cardiac dulness, apex-beat no longer visible, no murmur, temperature not much raised. As the dyspnea grew worse, and there was much cough, the pericardium was punctured by a fine trocar, and a litre of purulent fluid withdrawn, followed by a marked improvement in the general condition, and a rapid reduction of the cardiac dulness. A few days later the patient was as bad as ever, and the aspiration was repeated, 900 grammes of purulent fluid being withdrawn. Once again a litre of pus was removed by aspiration, and as the

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patient had then signs of pleuro-pneumonia on the left side, it was thought best to freely incise the pericardium.

This was done at the level of the fourth left costal cartilage, which was resected. A transverse incision of four centimetres was made in the pericardium, and two litres of purulent fluid mixed with large clots of fibrin were let out. The cavity was washed out with a solution of salicylic acid and two drainage-tubes inserted. Marked improvement followed the operation, and the wound healed completely in about three weeks; at the same time the other symptoms disappeared. Bacteriological examination of the pus showed the presence of the bacterium coli.

Hernia of the Linea Alba.

Mechues (*Berliner Klinik*, February, 1895) has collected thirty-eight recent cases of hernia of the linea alba, eleven of which treated by Kümmell, of Hamburg, are here recorded for the first time. This series of cases show that the most frequent situation of the hernia in the middle line is not near the ensiform process, but within an inch of the upper margin of the umbilicus. This form of rupture often follows violent muscular exertion, blows on the abdomen, or rapid emaciation. In several of the cases no distinct sac could be found at the time of operation.

Almost every patient belonged to the working-class, and of the whole number thirty were males and eight females. In most instances of hernia of the linea alba, even when it consists merely of a small protrusion of subperitoneal fat, it causes pain, vomiting, colic, and other severe symptoms out of all proportion to the nature and extent of the lesion.

The condition of the patient often becomes very distressing, as acute pain is brought on by very slight muscular exertion, and after taking food. In some few cases these symptoms may be removed or much alleviated by the wearing of a closely-fitting vest or girdle. The use of any kind of a truss supplied with a pad is to be avoided, as pressure directly applied to the seat of rupture is apt to dilate the abnormal opening and to cause adhesive inflammation of the hernial contents. In most instances, and especially in those in which the rupture is irreducible, an operation for radical cure is indicated.

The protrusion having been freely exposed, all adhesions about the neck of the sac should be carefully separated. The protruding omentum should be ligatured and removed, and the intestine carefully replaced in the abdominal cavity. Finally, the margin of the ring should be excised, and the raw edges brought together by sutures. If the hernia consist only of subperitoneal fat, this should be cut away. The results of this operation are as a rule very striking, and the painful symptoms cease immediately.

Traumatic Disease of the Vertebral Column.

Kümmell (*Deutsche medicinische Wochenschrift*, 1895) thinks that some cases in which simulation or exaggeration has hitherto been suspected may be thus explained. The symptoms observed by the author have been mostly the same, coming on after direct or indirect injury. The patient complains for some days of pain in the affected part. This gradually diminishes, but returns in the course of a few weeks or months. There may be neuralgic pains referred to the intercostal nerves, slight motor disturbances, and an uncertain gait. A kyphosis develops, the prominent vertebræ are as tender as in tuberculous spondylitis in the acute stage. There is

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never suppuration or thickening of the whole mass of bone. As to whether a compression fracture is present in the vertebral bodies, the author leaves the question undecided, but at any rate there is no severe splintering with dislocation. No pathological anatomy has as yet been obtained. The curvature is often not very pronounced. The treatment is satisfactory. At first the author used plaster of Paris, but now uses a special corset (Hessing) with a head support. An arrest in the rarefying ostitis occurs, and an anchylosis results. The corset must be worn for months, and in some cases years.

Sarcoma Successfully treated by Toxines.

Johnson (*New York Medical Record*, 1894) reports a case of sarcoma of the palate, which he successfully treated with toxines obtained from the cultures of the coccus of erysipelas and the bacillus prodigiosus. The patient was a boy, aged 16 years, who was suffering from a sarcoma of the soft palate, which upon examination was found to be of the spindle-cell variety. Injections of fifteen minims were given daily, the dose was increased each day until it had reached sixty minims.

The bacillus prodigiosus toxines were used in doses of five minims, and were administered along with the other toxines after the dose had reached thirty-five minims.

The injections were given in the arm and leg, and they generally caused redness, swelling, and pain, which persisted for twelve to thirty-six hours. The treatment was continued for about eight months, during which time there were many intermissions. The result of the treatment was a constant, steady, but slow improvement. The sarcomatous tissue gradually disappeared, partly by necrobiosis and partly by absorption. One year after the commencement of the treatment the patient had practically recovered, and the only signs of the disease being one or two spots of ulceration upon the palate, the other affected parts having cicatrized. The uvula and a small portion of the epiglottis were destroyed by ulceration.

THERAPEUTICS.

UNDER THE CHARGE OF

HORATIO C. WOOD, M.D., LL.D., AND ARTHUR A. STEVENS, M.D.

Antitoxin Treatment of Diphtheria.

A series of thirteen cases of diphtheria treated by antitoxin at the University College Hospital, London, under the care of Dr. Frederick Roberts, confirms the opinion that the remedy is one of considerable efficacy (*Lancet*, April 13, 1895). The cases, being all treated in hospitals and the diagnosis in each controlled by the bacteriological test, were observed under conditions favorable to the formation of a just appreciation of their character and of the influence of antitoxin upon them. In six out of the thirteen cases tracheotomy became necessary, only one of these tracheotomized subjects succumbing. Death from suppression of urine occurred after several weeks' illness in a case of pharyngeal diphtheria, a clue to this exceptional course being probably afforded by the fact that one of the kidneys

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was atrophied and cystic. It also suggested that the defective renal elimination in this case had some relation to the roseolous rash which appeared on the skin during treatment. In his remarks on these cases, it will be seen that Mr. Bunch, house physician, notes that a rash appeared in three cases, accompanied by a rise in temperature. His suggestion as to the possibility of the fluid containing some impurity is one deserving of the most careful scrutiny.—*The Universal Medical Journal.*

Iodine on the Temperature of Phthisis.

Cervello (*Arch. di Farm. e Ther.* and *Journal of the American Medical Association*, May 25, 1895) states that iodine introduced either by the cutaneous or subcutaneous channels is capable of lowering the temperature to normal. He used Durante's solution, which is composed of pure iodine, 1 gramme; potassium iodide, 10 grammes; distilled water, 100 grammes. One cubic centimetre of this is to be injected daily. Cervello believes that the iodine acts as an antiferment directly, and also destroys the pathogenic agents by accelerating the metamorphosis of their products. It is possible that this agent may prove a curative measure in tuberculosis. The author has only studied its antithermic action.

Electricity in Medicine.

Morton (*New York Medical Journal*, May 4, 1895) read a paper upon the above subject at the Eighty-ninth Annual Meeting of the Medical Society of the State of New York, in which he draws the following conclusions:

(1) I would suggest as a definition of electrotherapeutics, in a biological sense, that it is the transformation (by the law of conservation of energies) of electric energy into the energy peculiar to vital cells.

(2) Electricity in medicine must be regarded not as an entity, like a drug, but as having a variety of "properties," such as electrolysis, cataphoresis, contraction of protoplasm, etc., each of which properties may be employed, singly or combined, to combat given morbid conditions or diseases.

(3) Of the galvanic current it may be concluded,—

(*a*) That strong currents depress nutrition of tissues and produce structural changes leading to physiological atrophy (twenty to a hundred milliampères).

(*b*) That mild currents stimulate nutrition and produce physiological hypertrophy (one to eight milliampères).

(*c*) That mild galvanic currents, pulsating or alternating, produce similar effects to mild continuous currents.

(*d*) That the negative pole is specifically indicated in that large class of cases termed chronic inflammation where newly-formed fibrous tissue or exudate occurs.

(*e*) That upon the writer's theory—already accepted by several prominent physiologists—and observations, that catabolic or destructive events in tissue uniformly present the sign of negativity,—that is to say, are at their origin electropositive (resembling the zinc of a voltaic cell), the negative pole is indicated to arrest the catabolism, the positive to augment it.

(*f*) That the positive pole is rarely indicated, and, if so at all, upon the basis of an electrotonic effect to produce sedation of neuralgic pain in superficial nerves.

(4) Of the faradic current it may be concluded,—

(*a*) That its main uses are to tetanize muscle and to cause sedation of pain.

(*b*) That the tetanizing current as now employed to treat paralyzed muscles is injurious, since it enfeebles the muscle and causes atrophic structural changes.

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(*c*) That to strengthen or properly exercise a paralyzed muscle, a slow rhythm of the faradic current—about thirty waves to the second—should be adopted.

(*d*) That in some spastic conditions of muscles (due to paralysis of an opposing group) the strong tetanizing current may be used to advantage to over-stimulate, and thus to fatigue the muscle.

(5) Of the franklinic current or static electricity, it may be concluded that it is an adjunct of great efficiency in practice, since—

(*a*) It evokes the usual nerve and muscle reactions.

(*b*) It affords a most convenient means of stimulating the peripheral distribution of the nerves in the skin, producing counter-irritating, reflex, and other afferent impression effects.

(*c*) It has a local perturbatory action (spark).

(*d*) It produces profound alterations in the metabolism of the individual, increasing the natural waste products and diminishing the toxic or by-products. For this reason it is specifically indicated in cases of malnutrition, whether local or general.

The Formation of Phenyl-Sulphuric Ether and the Treatment of Carbolic-Acid Poisoning.

It has been shown by Baumann that carbolic acid, when absorbed, unites with sulphuric acid in the system and forms phenyl-sulphuric ether; also the use of sulphates has been advocated in carbolic-acid poisoning. Marfori (*Archives Italiennes de Biologie*, Tome XXII, Fasc. 2) records the results of a number of experiments made on animals in order to determine: (1) The quantity of phenol tolerated by the organism, and the amount of phenyl-sulphuric ether which can be formed; (2) the quantity tolerated when sulphates are administered simultaneously, and how much phenyl-sulphuric ether is then formed. These substances were administered by intravenous injection, and the sulphate used was ammonium sulphate. The author found that the tolerance for carbolic acid increased with the weight of the body of the animal. The quantity of phenyl-sulphuric ether formed—estimated by the amount of this substance in the urine—almost always remained much below that which would correspond to the phenol injected. Dogs were able to tolerate large doses of carbolic acid when ammonium sulphate was administered at the same time. The quantity of phenyl-sulphuric ether formed when carbolic acid and sulphate of ammonium were injected together was greater than when carbolic acid was injected alone. The sulphuric acid of the sulphate injected serves in part for the formation of phenyl-sulphuric ether. A large part of the phenol, however, does not combine with the sulphuric acid. There exists, then, a limit in the capacity of the organism for the formation of phenyl-sulphuric ether. As the tolerance of carbolic acid is increased by the presence of sulphates in the organism, the latter ought to be used in the case of carbolic-acid poisoning, though their action is very limited.

Influence of Laparotomy on Tuberculous Peritonitis.

Surgical intervention has profoundly modified the prognosis of tuberculous peritonitis within a comparatively short time. From recent statistics of Roerset (*Archive de Méd. exper.* and *Journal of the American Medical Association*, May 25, 1895) it seems that of 308 patients operated on 22.5 per cent. examined one year after the operation were perfectly cured. "We have cases cured for twenty-five years." (Spencer Wells.) The cases were genuine tuberculosis in those of

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Buzy, Conitzer, *et al.* The bacillary researches and inoculations were positive. What is the process of cure? Stchegoleff, operating on dogs in Strauss's laboratory, concludes:

(1) Tuberculous peritonitis of dogs may be cured by laparotomy alone, and at the beginning of the process twelve to fifteen days after inoculation.

(2) Recovery is due to an inflammatory reaction characterized by infiltration of embryonal cells; the phagocytosis is the active development of connective tissue.

(3) Curative action seems due to a variety of physical agents,—traumatism of the peritoneum, thermic influences, penetration of light and air into the peritoneal cavity.

(4) The complete evacuation of the abdominal exudate is not the sole cause of recovery.

(5) The dog is an animal somewhat feeble and very susceptible to tuberculosis if we use cultures of human tuberculosis.

Treatment of Chololithiasis.

Blum (*Münchener medicinische Wochenschrift*, March 19, 1895) draws attention to the value of large olive-oil injections in the treatment of biliary colic. These rectal injections can be substituted for the large doses of olive oil given by the mouth, to which patients often object, and which may disturb the functions of the stomach. In addition to the probable cholagogue action of these injections, olive oil has a slight laxative action. The author follows Fleiner's directions in giving these large enemata: 400 to 500 cubic centimetres of pure warm oil are introduced, at first daily, and subsequently at longer intervals. The author gives details of five cases treated with benefit in this way.

OBSTETRICS.

UNDER THE CHARGE OF

BARTON COOKE HIRST, M.D.,

ASSISTED BY

RICHARD C. NORRIS, M.D., AND FRANK W. TALLEY, M.D.

The Rapid Progress of Tuberculosis During Pregnancy, Its Influence on Mother and Child.

Dr. S. Remy (*Archives de Tocologie et de Gynécologie*, September, 1894, p. 661) refers to the fact that the abatement of the evolution of tubercle during the first months of pregnancy, the very usual increase of the disease in consequence of the constitutional changes of gestation, the explosion caused by the puerperal state, and especially by nursing the child, have been long recognized by all authors who have considered this question. Attention is called to one class of cases: tuberculous women in whom the disease evolves very rapidly in consequence of an acute malnutrition and speedily by a resulting continued fever, it may be by an intolerance of food which causes it to be rejected, or it may be from a profound distaste to all nourishment; possibly the pain arising from laryngeal phthisis may be the

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reason. The patients waste rapidly and fall into a condition of extreme weakness. The tubercular lesions remain practically localized. One is inclined to say of these patients that they are more phthisical than tubercular. Nine months of pregnancy are a long time for such patients, and the doctor anxiously considers, can such a patient wait until the completion of pregnancy, or will death come before delivery? The disease may arise in women who have previously shown symptoms of tubercle, but who seemed cured, and may be reawakened in consequence of a new pregnancy. We find other patients in what is called delicate health, others enjoy habitual good health.

Of the five patients reported, four had been affected with laryngeal phthisis. From gastric troubles, difficulty in deglutition, wasting, and weakness, they deteriorated rapidly, and at the end of some months the thinness, the weakness, and the fever left no hope that we would see them reach full-term pregnancy. Were they to die undelivered? Death during pregnancy is, however, exceptional. In the case of acute diseases, whether due to pregnancy or not, the gravity of the symptoms—the blood intoxication, hemoptysis—sometimes causes death so quickly that the maternal organism has not time to expel the product of conception. This we have seen. But in chronic cases, and even in some subacute, if there is no unexpected incident causing death, it may be suddenly or in some hours, as, for example, from suffocation, pulmonary edema, or hemoptysis, occurring in cardiac or pulmonary affections, the maternal organism prematurely expels its contents by a sort of natural precaution, as a tree which withers lets fall its fruit. The premature expulsion is accomplished without shock, without warning, as easily as a full-time accouchement. On examining the placenta, Remy finds that its uterine surface is whitish instead of dark-red, as in the normal placenta. This was evidently due to degeneration of the decidual cells.

The five observations reported seem to show that in a case in which weakness during pregnancy becomes complicated by rapidly developing tuberculosis (only apparent in the beginning of or during the pregnancy) of such a degree that death seems inevitable before the full term, the organism may still accomplish a spontaneous premature confinement, provided that neither dyspnea nor congestive affections due to the condition of the respiratory organs hastens the end. These cases ought to be considered by the authors who seek to determine that in such conditions either induced abortion or premature labor can be of service to pregnant women who are the subjects of tuberculosis. Of the five patients, three who had marked laryngeal phthisis died about the tenth or twelfth day after confinement; a fourth on the twentieth day; the other patient, whose lungs were affected, one month after her premature delivery.

Puerperal Insanity.

Dr. Dagonet (*Progrès Médical*, April 7, 1894).—The puerperal condition, properly speaking, refers only to the functional and organic modifications which take place in women during and after parturition, before the return of the menses, or the physiological establishment of lactation. But from the point of view of puerperal insanity this period may be divided into three periods: (1) gestation; (2) puerperal condition proper; (3) lactation.

The following statistics show the relative frequency of psychosis in each of these periods: gestation, 3.1 in 100; puerperal condition proper, 9.2 in 100; lactation, 3.6 in 100. According to Marcé, insanity caused by pregnancy generally develops about the end of the fourth month, and increases progressively. Melancholia is the most frequent form. Schmidt gives the fol-

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lowing proportions: 52.9 in 100, melancholia; 31.3 in 100, mania; 10.3 in 100, systematized delirium; 5.8 in 100, general paralytic dementia. Marcé observes that labor seldom relieves this form of mental disease; on the contrary, the symptoms are generally aggravated, and melancholia often assumes the form of more or less violent mania. Abortion, sometimes recommended as a curative measure, should be strictly forbidden. Gestation, with these patients, is usually normal, and abortion seldom occurs spontaneously. The opinion advanced by some authors that pregnancy exerts a beneficial influence upon insanity already established is not sustained by statistics. Esquirol believes that marriage and labor generally stimulate the disease. When psychosis appears at an early period prognosis is more favorable than when it occurs towards the end of gestation, but it generally persists for several months, and relapses may be expected in subsequent pregnancies. The causes of puerperal insanity proper—that is, insanity which develops during the period following labor before the organs of generation have resumed their normal functions—are divided by Campbell-Clark into predisposing causes and producing causes. In the first category, hereditary predisposition is the most important, as it exists in 56 per cent. of these cases. The complicated influences affecting a first pregnancy are next in order. Nearly half the patients suffering from this form of psychosis are primiparæ. Among producing causes infection occupies the first rank, infection of the uterus or of other organs. Campbell-Clark reports 70 of 100 cases caused by infection; 66 by infection of the uterus, 4 of the kidneys. More than half these patients were under the influence of intense moral emotions; and we realize the importance of this influence when we consider the large number of women who suffer from puerperal infection. Dr. Idanof gives the proportion as 8 or 9 per cent., and the comparative variety of puerperal insanity. The disease usually appears about the fourth or fifth day. Irritability, insomnia, headache, agitation, diminished secretion of milk, are premonitory symptoms. Fever may or may not be present, but the head is always hot. Sometimes the disease assumes a fatal form, when the tongue becomes dry and furred, the secretions cease abruptly, and the patient falls into a comatose state, which soon ends in death. Puerperal insanity proper assumes the most diverse forms: mania in 47.8 per cent.; melancholia in 37.9 per cent.; systematized delirium in 5.8 per cent.; acute dementia in 5.5 per cent. Prognosis is favorable in most cases, more favorable in mania than in melancholia. Patients suffering from insanity after prolonged lactation usually present symptoms of extreme exhaustion. Prognosis is not unfavorable, but more grave than in puerperal insanity proper. Therapeutic indications are the same in all kinds of puerperal insanity. Treatment consists in the removal of all exciting causes, a tonic *régime*, mild purgatives, injections of chloral hydrate, and other soothing influences.

Transverse Positions of the Head at the Outlet of the Pelvis.

Maurice Muret (*Revue Médecine de la Suisse Romain*, xiv, No. 1, 1894) considers an etiological division into primary, secondary, and mixed cases.

Primary transverse position at the outlet occurs in the simple flat pelvis, both non-rachitic, and the rachitic pelvis that has taken this form, in double congenital dislocation of the hips, and in the contracted flat pelvis. In simple flat pelvis sinciput is lower, while in the contracted flat pelvis, the head being more strongly flexed, the occiput is lower. Furthermore, the position occurs in the funnel-shaped pelvis and in the larger pelvis when a small head following a sudden rupture of the membranes is rapidly driven through the pelvis.

Secondary transverse position at the outlet occurs where heads are large, with

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wide occiput, which remains posteriorly in the passage through the pelvis. During the rotation at the outlet if the pains give out, the above position, which is transitional, results. The anterior fontanelle is usually lower.

The mixed form occurs in flat pelvis large enough to allow the head to pass the inlet in an oblique diameter with the occiput posteriorly, but where, at the outlet, the contraction prevents a complete rotation of the occiput to the front. The results of this position are different. The pains may cease, or, in spite of strong pain, the head may remain impacted in the pelvic outlet. Sloughing of portions of vagina and fistulæ may result. The child may die. With powerful pains the head may be driven through the bony outlet and stop on the muscular pelvic floor. Very rarely the delivery may be spontaneous in the transverse position, especially in cases of large pelves with small heads and old perineal tears. Even in the contracted flat pelvis the head, if strongly flexed, may be born in the transverse position. If rotation occurs in the outlet it is usually rapid, rarely slow, occasionally the occiput rotates posteriorly; or, the rotation may occur without the pelvic outlet in the soft parts.

In the diagnosis, accurate pelvic measurement is important. The majority of the primary cases were, in his experience, occipito-anterior presentations; of the secondary cases, occipito-posterior.

The diagnosis from the position of the fontanelles is often made difficult by the large caput succedaneum; occasionally an ear may be easily felt behind the symphysis. The prognosis for mother and child is in general not unfavorable. A long labor, especially in the primary cases, is dangerous.

Treatment, at first expectant. The woman is placed upon the side towards which the occiput points. If the labor does not progress, an effort is made to rotate the head, with two fingers passed up behind the ear lying behind the symphysis, according to Tarnier. This is useless in cases of contracted pelvis. If forceps become necessary Muret advises the oblique application, but not to attempt rotation with the forceps; when the head has reached the muscular pelvic floor the forceps is removed. Then rotation can be effected by means of two fingers upon the smaller fontanelle, while two fingers introduced into the rectum press the forehead posteriorly. In the cases of funnel-shaped and contracted flat pelvis, if the child is living, symphyseotomy may be preferred. If the child is dead, craniotomy.

Etiology of Endometritis during Pregnancy.

Emmanuel (Vienna, *Congress of Naturalists, etc.*, September 24-30, 1894), investigating three cases of endometritis during pregnancy, found numerous intracellular diplococci closely resembling gonococci in the true decidua in the first, and in the serotina in the second. These micro-organisms did not stain by Gram's method.

The subject of the first observation again suffered during a subsequent pregnancy from endometritis, probably contracted before conception, and aborted at the fourth month. The true decidua were greatly altered, thickened, and were strewn with small round cells, particularly abundant on the surface. In these cellular foci Emmanuel found long filaments made up of short bacilli, staining by Gram and Weigert's method and growing in agar-agar. This bacillus had many of the characteristics of the *bacillus coli communis*, but differed in its reaction to Gram's method.

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Intermittent Fever in Childbed.

M. Solowieff (*Revue méd. Chir. des Maladies des Femmes*, June, 1894) relates the case of a woman suddenly attacked by an intense fever at the end of her pregnancy, of another in whom the fever came on two weeks after delivery, and of a third who was affected about the middle of her term. In all cases treatment with quinine and opium, associated in the last instance with arsenic, was effective. Dr. Solowieff concludes that though intermittent fever is relatively rare during pregnancy and puerpery it may be the cause of abortion, premature delivery, or in some cases of the death of the fetus. In those recently delivered it may interfere with the secretion of the milk and the involution of the uterus. He attaches great importance to the diagnosis of this fever from other affections of childbed, especially from puerperal septicemia, and while recommending that where there is any tendency to abortion some preparation of opium should be added to the usual treatment by quinine. He points out that in nursing women suffering from paludal diarrhea opium should not form part of the treatment, or lactation must be abandoned, and suggests treatment with tannate of quinine. He holds that arsenic in small doses is good for all cases of puerperal asthenia. Dr. Solowieff maintained his conclusions in spite of an objection by Dr. Alexanderoff that, in the absence of microscopical examination of the blood, they were not definitive.

The Origin of Puerperal Osteomalacia.

Hermann Löhlein (*Centralblatt für Gynäkologie*, January 6, 1894), considering the subject of puerperal osteomalacia, refers to the supposition that osteomalacia is a disease of parasitic origin, as has been frequently expressed, and by none more powerfully than Kehrer. The number who supported this view was never large, and many who were disposed to regard it as an infective disease have found a direct contradiction of the theory in the fact that the disease has been cured by the Porro operation and by oöphorectomy. These cures by operation, however, only serve to deepen the mystery enveloping the condition. However improbable it may appear that osteomalacia is due to the action of osteolytic micro-organisms, it is our duty, whenever opportunity offers, to examine affected portions of bone bacteriologically. So far as I know no observations have hitherto been made upon bones recently affected. Such observations have now been made in a case occurring in Löhlein's clinic.

Frau J., IV-para, became afflicted with osteomalacia towards the end of her second pregnancy, seven years ago. In the third pregnancy she was confined to bed for fully six months, but after delivery improved rapidly, so that she was able to get up in three weeks. In her last pregnancy (last menstruation April, 1893) the pains came on very early, but until the beginning of October, 1893, she could move about, although painfully; from that time she was bedridden. She was examined November 8, 1893; it was found that the thorax had sunk down upon the pelvis, there was great emaciation, and gently moving the pelvis, the ribs and the thighs caused pain.

Treatment.—Warm salt baths, phosphorus, and cod-liver oil. This produced no improvement. On November 18, Porro's operation was performed. At the end of the operation, Löhlein excised a small piece of the right iliac crest, the size of a bean, with a sterilized scalpel, and placed it at once in peptone-glycerin-agar. The plate remained perfectly sterile.

Microscopic examination of numerous sections of the somewhat atrophic ovaries showed that no micro-organisms were present in them either. As regards

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the patient, the result of the operation has not, so far, been very satisfactory. The pains disappeared much more slowly than in his previous cases, and at the end of the fourth week the patient could only just attempt to walk. Of the ultimate result Löhlein does not care to speak until the woman has been for at least a year under observation.

THE FIRST SUCCESSFUL CASE OF CESAREAN SECTION IN PLACENTA PRÆVIA, AND REMARKS ON THE METHOD OF OPERATION.

BERNAYS (*Journal of the American Medical Association*, Vol. XXII, No. 19) reports a successful case of Cesarean section, performed on a woman 42 years of age, in which sudden severe hemorrhage had taken place about three weeks before full term, owing to the existence of placenta prævia. The operation was completed in twenty-five minutes. The uterine wound was closed by twelve silk sutures, which embraced all three layers of the walls, and by a few superficial sutures where the edges gaped. Bernays sees no especial advantage in following Sänger's method. The uterine cavity was drained after the operation by means of a tube passed into it through the vagina.

GYNECOLOGY.

UNDER THE CHARGE OF

CHARLES BINGHAM PENROSE, M.D.,

ASSISTED BY

WILLIAM A. CAREY, M.D., AND H. D. BEYEA, M.D.

STEAM AS A HEMOSTATIC.

SNEGIRJOFF (*Centralblatt für Gynäkologie*, No. 3, 1895) advises the use of steam as a new method of controlling hemorrhage during operation. For the last seven years the writer has employed this method of controlling hemorrhage after dilatation and curettement of the uterine cavity. A small metal canula, attached by a rubber tube to a kettle containing water at the boiling-point, is introduced into the cervical canal. The steam is applied for one minute. It is always followed immediately by complete hemostasis and is not associated with pain or other symptoms. Applied in carcinoma of the uterus the fetid discharge and hemorrhage disappear, and the pain is relieved. Experimentally applied to the uterine cavity of an extirpated uterus, the endometrium was found to be cauterized and was covered with a thin white membrane. Thus it acts as a cauterizant, hemostatic, anesthetic, and antiseptic.

Prompted by these observations, Snegirjoff, with the assistance of Blagowolinof, carried out a series of experiments on animals with the following results: The liver was extirpated with the loss of but little blood, the animal living; also a portion of the spleen, lung, kidney, and brain. Hemorrhage from bone was controlled, a new growth of bone tissue following the operation. A horn of the uterus of a dog was excised. Bleeding from a longitudinal or transverse incision in the femoral artery ceased after the application. Muscle or skin hemorrhage ceased immediately. The operation was always followed by primary union. After

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this experimentation Snegirjoff began, in 1893, to apply the method in a series of operations at the Alxinas Hospital. In five cases of resection of the knee-joint the operation was performed without the use of an Esmarch tube, hemostatic forceps, or ligature. In amputation of the breast for cancer, and cancer, lipoma, and cavernous tumors of the skin, in the amputation of the cervix, in the operation of hysterectomy for fibroid tumors, to control hemorrhage from the stump. After the incision of abscesses as a method of disinfection, in hemorrhage from a sinus or fistula, particularly if tubercular, hemorrhage was controlled entirely by the use of steam in the manner described.

PINCUS (*Centralblatt für Gynäkologie*, No. 11, 1895) refers to the above publication and reports nine cases where steam was employed in controlling hemorrhage from the uterine cavity, and in treating endometritis. His cases were:

(1) One case of inoperable carcinoma of the fundus uteri. *Symptoms:* Severe pain in the pelvis, hemorrhage, and fetid discharge. *Result:* The application was immediately followed by a discharge of dark-colored fluid containing degenerated tissue. The hemorrhage and fetid discharge disappeared and returned only after eleven days. The treatment was continued for one and a half minutes, and was not associated with any degree of pain.

(2) Three cases of uncomplicated hyperplastic endometritis. *Symptoms:* Severe menorrhagia (fourteen to eighteen, and eight to ten days). In one case three applications were made, each lasting one minute. The menstruation during the next two months following was regular and normal, lasting two to three days. The two other cases he has observed but two and three weeks. The hemorrhage had not returned. About the third day after each application there is a profuse leucorrheal discharge, which completely ceased on the ninth to twelfth day. In one of these last cases the treatment was followed by uterine colic.

(3) Five cases of cervical endometritis are under treatment, but have not been observed long enough to report any definite result.

Pincus concludes that the method is of undoubted value, particularly from a bacteriological stand-point, and that it should be of great value in septic puerperal endometritis.

A CASE OF TUBERCULAR MENINGITIS FOLLOWING THE REMOVAL OF BILATERAL TUBERCULAR PYOSALPINX.

BINOUD (*Gazette médicale de Paris*, No. 27, 1894). The statistics of Daurios and Massia, with forty-one operations for tubercular adnexa disease, show the prognosis to be very bad, four patients dying as a result of operation, and the others secondarily of general tuberculosis, peritonitis, or phthisis. Binoud reports the following case. A servant, 26 years of age, always comparatively healthy, was taken ill without cause in the middle of January, 1892, complaining of pain in the lower abdomen, headache, and fever. The diagnosis at this time was influenza. A few days after this attack menstruation appeared, with severe pain lasting throughout the period. The patient remained out of bed, but was able to work very little. The menstrual flow did not appear again, but the pain in the lower abdomen became continuous. Observing a swelling in the left iliac fossa she applied to the hospital for treatment. On examination the abdomen was tense, painful, and in the left iliac region a fluctuating, movable tumor, the size of a fetal head, could easily be felt. The uterus was in normal position. In the left vaginal fornix a fluctuating tumor attached to the uterus was easily palpated. A much smaller tumor was also demonstrable on the right side. The other organs were healthy. There was no fever. On May 5, 1895, celiotomy was performed. After

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opening the abdominal cavity the sac on the left side was aspirated, removing ten and a half ounces of pus. The sac wall was extirpated with great difficulty. The right tube, containing four ounces of pus, was also removed. The uterus and intestines appeared healthy. The peritoneal cavity was drained with gauze, and the wound closed. Convalescence was uneventful until the twenty-fifth day, when the patient began to vomit, and tubercular meningitis appeared, with fever, headache, trismus, strabismus, and progressive depression. After five days the patient became comatous and died ten days later. The post mortem showed no signs of peritonitis, few adhesions between the omentum and abdominal wall and normal abdominal organs. The lungs were edematous. At the base of the brain and in the ventricles there was a cloudy exudate, and the vessels were covered with miliary tubercles. The meningitis certainly appeared after the operation and was secondary to the adnexa disease. This is the only case of tubercular metastasis from the uterine adnexa to the brain on record. Binoud believes that when possible tubercular organs should be removed.

Horny Epithelial Change in the Uterine Mucous Membrane.

Rosthorn (*Centralblatt für Gynäkologie*, No. 15, 1895) reports the following interesting case of horny epithelial change in the corporal and cervical endometrium. The patient was a woman, 41 years of age, in whom he had curetted the uterus a year and a half before. She returned, complaining of profuse uterine hemorrhage, and complete hysterectomy was advised. Microscopical examination showed the corporal and cervical endometrium everywhere covered with horny, squamous epithelial cells. Only over a single small area was the epithelial growth irregular. This early condition of transformation of epithelium, especially cylindrical, into squamous, with the production of emboliform areas, the writer believes is the beginning of epithelioma. This change in the uterine mucous membrane has occasionally been mentioned by others. In conclusion, he emphasizes the importance of making a microscopical examination of all portions of tissue removed by the curette.

A Contribution to Tubercular Disease of the Uterus.

Emanuel (*Zeitschrift für Geburtshülfe und Gynäkologie*, Bd. xxix) emphasizes the advantages of careful microscopical examination of all tumors and inflammatory processes of the genital organs, and as a proof of its importance he reports the case of a woman, 50 years of age. *Vaginal examination.*—The perineum was found covered by a sloughing ulcer, four inches in length and three-quarters of an inch in breadth. A tumor the size of an apple was attached to the cervix, causing secondary ulceration of the surrounding vagina. The uterus was considerably enlarged and anteflexed. There was some tenderness in both ovarian regions. The ulcer of the perineum was excised, also a portion of the tumor, and subjected to microscopical examination. They were both proven to be tubercular. At this time there were no physical signs of pulmonary involvement. The uterus, tubes, and ovaries, the diseased portion of the vagina, and an enlarged lymph-gland were removed by the vagino-abdominal method. The patient died in shock. The cause of death, proven post mortem, was fatty metamorphosis of the heart-muscle. The spleen, liver, kidneys, and peritoneum were found infiltrated with miliary tubercles. The adnexa and lungs were healthy. The endometrium was completely destroyed by the tubercular disease, and the

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uterine cavity was filled with caseous material. The writer here describes in detail the characteristic microscopical lesions of tuberculosis found in the sections made through the uterus, vagina, and perineum. That the disease was tubercular is beyond doubt. He further writes that tuberculosis of the uterus has rarely been described, since he believes the cases are taken for malignant disease, removed, and no microscopical examination made. The primary lesion in the above case must have been in the cervix uteri; the vagina, uterine cavity, and perineum being secondarily infected. Only two cases similar to this one have been reported. The infection of the female genital tract can take place through coitus; secondarily, by metastasis by way of the blood-vessels; and most frequently from the lungs and from general tuberculosis of the peritoneum. In this case, only the peritoneum covering the tubes was infiltrated with miliary tubercles.

CORRESPONDENCE.

THE PRESENT STATUS OF HYSTERECTOMY IN PUERPERAL SEPSIS.

To the Editors of UNIVERSITY MEDICAL MAGAZINE.

Sirs:—I was much interested in the well written and valuable editorial, in your last issue, upon "The Present Status of Hysterectomy in Puerperal Sepsis." This subject is the most important in obstetrics to-day. Clinical experience is accumulating rapidly and it will not be long before we will be guided by rules of practice as definite and undisputed as those that govern us in the treatment of extra-uterine pregnancy. These rules, it seems to me, will be formulated mainly by men who are equally familiar with the various kinds of sepsis after labor and with the possibilities of pelvic surgery. The gynecologist, pure and simple, is not experienced enough in the recognition and management of those forms of sepsis that are not amenable to surgical treatment, but that can be cured by proper management, while the obstetrician without surgical skill usually allows the opportunity for successful surgical intervention to pass.

With a large experience in all forms of sepsis after labor, and with a large experience in hysterectomy for puerperal sepsis, I am unable to agree entirely with the views expressed in your editorial. In the first place, hysterectomy is often required late in the puerperium and is very successful at that period. I have had four operations from two to four weeks after delivery, all for suppurative metritis and all successful. The early hysterectomies have furnished the highest death-rates, because many have been done for diphtheritic endometritis

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and for virulent phlebitis, necessarily without success. There is, however, no time limit for hysterectomy for puerperal sepsis. It may be indicated early, but is more likely to be needed late in the puerperium.

Another point that should have been more clearly stated, I think, is this: As a rule, avoid an abdominal section for puerperal sepsis if the septic inflammation has not spread beyond the womb,—that is, if there are no adhesions, no exudate, no marked enlargement of the tubes and ovaries.

Another proposition of equal importance is this: When an abdominal section is performed for puerperal sepsis always be prepared to do a hysterectomy; resting content, of course, with the least radical procedure that promises a good result, but always prepared to remove all diseased structures, including tubes, ovaries, womb, and the whole of both broad ligaments.

The decision as to what must be done can scarcely ever be made till the abdomen is opened; the operator, therefore, should begin his operation with an open mind, prepared to evacuate, wash out, and drain abscesses, to remove tubes and ovaries, to excise the womb and broad ligaments, or to close the abdomen without disturbing any of the intra-abdominal structures, seizing an opportunity, perhaps, to evacuate pus extraperitoneally above Poupart's ligament or through the lateral vaults of the vagina, or finding possibly that there is no occasion for surgical interference.

Very respectfully,

BARTON COOKE HIRST.

BOOK NOTICES.

SURGICAL PATHOLOGY AND THERAPEUTICS. By JOHN COLLINS WARREN, M.D., Professor of Surgery in Harvard University, etc. Philadelphia: W. B. Saunders, 1895.

It is almost unnecessary at this time to dwell upon the importance of a thorough knowledge of pathology, and at least a clear understanding of bacteriology in order to apply rational therapeutics in the treatment of disease. The subject of surgical pathology has been much neglected. The need of a systematic treatise on this subject quite justifies the appearance of Dr. Warren's work.

The first two chapters of the book are devoted to bacteriology. A distinctive feature is the excellence of the colored plates showing the appearance of the various important bacteria as seen both in test-tube cultures and in microscopic preparations. Chapters on hyperemia and inflammation follow. The etiology of inflammation has not yet been

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satisfactorily settled, but Dr. Warren is inclined to give prominence to the old view which considers inflammation to be due to perverted nerve action. The inflammations caused by bacteria, the author terms infective. These receive extended consideration.

The process of repair has been well described in chapter nine. The next chapter is devoted to the subject of gangrene. The different views concerning the condition known as shock have received full discussion, but the subject is still an open question. Many practical suggestions concerning this condition are to be found in the portion of the book devoted to this subject. Regarding operations on patients suffering from shock, the author urges the sacrificing of many details usually employed in order to reduce the time consumed to a minimum. We are glad to see the statement that transfusion is now abolished. It has been supplanted by the use of normal salt solution, administered either subcutaneously or intravenously. Fever is discussed from the modern stand-point, as the following quotation will show. "In general it may be said, therefore, that fever is due to the presence in the blood of a pyrogenous substance of an organic nature that may have been produced by bacteria, or to the presence of bacteria, or, finally, to some ferment-like substance, which has resulted from cell-disintegration." The subjects of septicemia and pyemia receive full discussion. Erysipelas has been given the full consideration which its importance demands. Hospital gangrene continues to occupy a considerable space. The author justly remarked that this disease is one with which few teachers to-day have had experience, and which students never see. In view of this fact, it is questionable whether less space should not be given to it.

Upward of ninety pages are devoted to the subject of tuberculosis. The frequent occurrence of the surgical forms of this disease renders this extended description very timely. Among other important chapters are those on carcinoma, sarcoma, and diseases of bone. Dr. Warren has throughout the work presented the most modern views on the pathology of surgical affections. He has endeavored to associate pathological conditions as closely as possible with the symptoms and treatment of surgical diseases. Numerous cases are described which serve to illustrate many of the conditions under discussion. The colored plates and engravings are of a high order of excellence. The book deserves a place in every surgical library.

A SYSTEM OF LEGAL MEDICINE. By ALLEN MCLANE HAMILTON, M.D., Consulting Physician to the Insane Asylums of New York, etc., and LAWRENCE GODKIN, Esq,, of the New York Bar. Volume II. New York: E. B. Treat, 1894.

The second volume of this valuable work fully sustains the favorable impression created by the appearance of the first. Among the contributors to this volume we notice, besides the authors, Hon. William B. Hornblower, Hon. Calvin S. Pratt, Dr. B. Sachs, Dr. Charles K. Mills, Dr. Charles L. Dana, Dr. P. G. Knapp, Dr. A. F. Currier, Dr. C. Jewett, Dr. F. R. Sturgis, Dr. S. E. Baldwin, Dr. C. G. Chaddock, Dr. George R. Fowler, and others.

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The duties and responsibilities of medical experts are briefly outlined. Insanity in its medico-legal bearings is exhaustively treated in an article covering 140 pages. An excellent bibliography is appended. The mental responsibility of the insane in civil cases is set forth from a legal stand-point. The relations between insanity and crime are well presented, as are also the relations of mental defect and disease to criminal responsibility. Aphasia and other affections of speech forms an interesting chapter. The traumatic neuroses, being a description of the chronic nervous disorders that follow shock and injury, a subject that has recently assumed considerable prominence, have been very fully and carefully described. The other chapters are no less interesting nor less worthy of praise.

A feature of this work is the introduction of new examples to illustrate many of the subjects, and the large amount of new experimental research that is presented.

Numerous illustrations, some of which are colored, appear throughout the text. The paper, press-work, and binding are all that could be desired. There is an appendix containing extracts from the laws of the different States and Territories of the United States which relate to the general care of the insane.

The book will be an invaluable aid to physicians and lawyers who desire the most advanced opinions of practical students of forensic medicine. Until the appearance of Dr. Hamilton's system, we have had no recent American work the scope of which answered the demands of the present time.

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UNIVERSITY
MEDICAL MAGAZINE.

SEPTEMBER, 1895.

OBLITERATION OF THE APPENDIX VERMIFORMIS.

By George A. Piersol, M.D.,
Professor of Anatomy in the University of Pennsylvania.

The fact that the vermiform appendix in man is affected by retrogressive, but non-pathological, processes which lead in a considerable proportion of all subjects to the partial or even total obliteration of this part of the gut, is a matter of interest in view of the conspicuous *rôle* played by this organ in recent medical literature.

Although the partial or total occlusion of the appendix has been noted by a number of authors, among whom are Sömmering, Cruveilhier, Krause, Sappey, Bierhoff, Fitz, Wölfler, Kelynack, and Berry, it is, especially to Ribbert and, more recently, to Zuckerkandl, that we are indebted for the extended systematic observations which have established the great frequency with which involution of the vermiform appendix takes place in man.

Ribbert[1] examined 400 appendices and found in ninety-nine, or 25 per cent., either partial or complete obliteration of the lumen, accompanied by marked alterations in the mucous and submucous coats. When the appendices of subjects over 25 years of age alone were considered, the proportion was still higher, then reaching 32 per cent. The occlusion usually consists of only partial obliteration of the lumen, since only in three and one-half per cent. was the entire canal affected.

The frequency of these changes, as established by Zuckerkandl's[2] observations, agrees closely with the results above cited, since of the 232 appendices examined by this anatomist, in fifty-five, or 23.7 per

[1] Ribbert, Beiträge zur normalen und pathologische Anatomien des Wurmfortsatzes. Virchow's Archiv für Pathologie, Band 132, 1893.

[2] Zuckerkandl, Ueber die Obliteration des Wurmfortsatzes beim Menschen. Meckel und Bonnet's anatomische Hefte, XI Heft, 1894.

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cent., were the involution processes established. Approximately 14 per cent. of these showed obliteration of the lumen throughout their entire, or almost entire, length, while of the remaining 9 per cent., the partial closure most frequently affected the distal half of the appendix.

The length of the human vermiform appendix of the adult subject presents great variations, the average length being approximately nine and a half centimetres, or about four inches; the extremes of its length, however, embrace a wide latitude, since the tube may be as short as seventeen millimetres (Zuckerkandl[1]), or may measure as much as 230 millimetres (Luschka[2]). While attaining its greatest absolute length between the twelfth and twentieth years, the appendix bears a relatively greater length to that of the colon at birth than in adolescence; the proportion in the former case being 1 : 10, in the latter, 1 : 20. Based upon the examination of 100 appendices, Berry[3] concludes that there is no apparent relation between the length of the appendix and the size of the cecum. This author further finds the average diameter of the appendix to be six millimetres at its base and middle, and five millimetres at its end.

The length of the appendix, moreover, bears an important, although by no means constant, relation to the frequency of its involution, since the extended observations of Ribbert show that, in general, the shorter the diverticulum the more certainly are atrophic changes encountered. In appendices shorter than five centimetres, or less than one-half the average length, closure is exhibited in more than 50 per cent.; in those of extreme shortness, occlusion almost invariably occurs.

Sex seemingly exerts but little influence on these atrophic processes, since obliteration is met with about equally frequent in male and female subjects.

Recalling the fact that the vermiform appendix morphologically represents, not an outgrowth from the *caput coli*, but the rudimentary apex of the cæcum, which has failed to keep pace in its development and growth with the remaining parts of the colon, and, therefore, becomes overshadowed by the increasing proportions of the adjacent parts of the large intestine, we are prepared for the great variation observed in the frequency with which occlusion occurs at different ages.

In accordance with what may be anticipated from the history of a rudimentary organ whose functional importance becomes progressively less as age advances, evidences of obliteration are seldom observed in

[1] Loc. cit., p. 106.

[2] Luschka, Anatomie des Menschen, Band 2, 1863.

[3] Berry: The anatomy of the vermiform appendix. Anatomischer Anzeiger, Bd. v, No. 24, 1895.

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the early years of life. Prior to the fifth year they have never been encountered, and to the tenth year the affected subjects number only 4 per cent.; after the sixtieth year, on the contrary, in over half are the involution processes established.

The following table from Ribbert's[1] paper exhibits the increasing frequency of these changes with the advance of age:

1 to 10 years,	obliteration	processes	encountered	in	4	per cent.
10 to 20	"	"	"	"	" 11	"
20 to 30	"	"	"	"	" 17	"
30 to 40	"	"	"	"	" 25	"
40 to 50	"	"	"	"	" 27	"
50 to 60	"	"	"	"	" 36	"
60 to 70	"	"	"	"	" 53	"
70 to 80	"	"	"	"	" 58	"

The appendix attains its fullest structural development from the tenth to the twentieth year. During this period, when examined in transverse sections, the wall of the diverticulum consists of the four general coats common to the gut-tract,—the mucosa, the submucosa, the muscularis, and the serosa. The mucosa presents the usual characteristics of the lining layer of the colon, containing numerous glands of Lieberkühn and a generous amount of lymphoid tissue. This latter first appears as definite follicles about birth and increases in quantity during the early years, until the lymph-follicles, or solitary glands, become so closely placed that they constitute in places almost an unbroken zone of adenoid tissue. The solitary follicles are most numerous during childhood, but maintain their prominence, with little diminution, until towards the thirtieth year, after which they gradually diminish in size and encroach less upon the mucosa.

The relations between the glands of Lieberkühn and the solitary lymph-follicles are by no means constant, since, as pointed out by Stöhr,[2] its character as a retrogressive organ renders the appendix particularly subject to variation in its histology; in many places both glands and follicles appear in their normal relation, while in others, even within the same appendix, either follicles or glands may be greatly diminished or almost suppressed.

The changes taking place within the appendix which lead to the more or less complete obliteration of the lumen and adjacent coats are limited to the mucosa and the submucosa, the muscular and serous layers being but seldom involved.

Examination of obliterating appendices lead the writer to agree

[1] Loc. cit.
[2] Stöhr, Verhandlungen der anatomische Gesellschaft, 1891.

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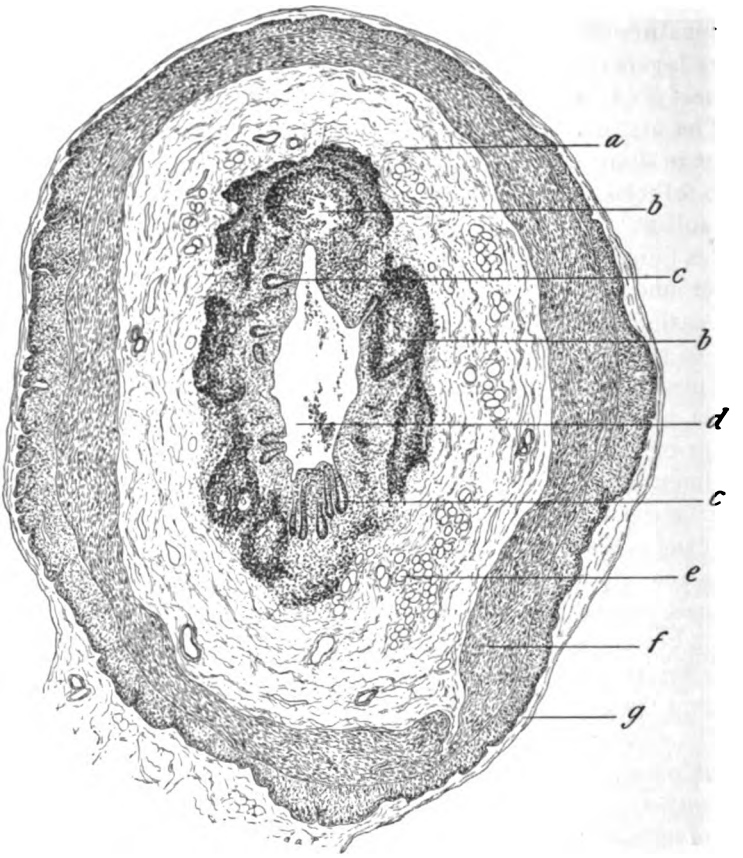
with Zuckerkandl's conclusions that changes within the submucosa inaugurate the processes leading to the retrogression of the appendix and precede the alterations affecting the mucous membrane.

FIG. 1.



TRANSVERSE SECTION OF VERMIFORM APPENDIX OF MAN, AGED 58, MAGNIFIED TWENTY DIAMETERS.

The appendix shows well-advanced changes leading to obliteration of lumen and atrophy of mucosa. *a*, Thickened submucosa containing groups of adipose cells (*e*); *b*, *b*, the atrophic lymph-follicles contained within the mucosa invaded by lymphoid cells; *c*, *c*, the remains of the glands of Lieberkühn; *d*, the decreased lumen of the tube; *f*, muscular tissue, consisting of inner circular and external longitudinal layer; *g*, peritoneal tissue.

These changes consist, in the initial stage, in the large majority of cases, of a marked increase in the thickness of the submucosa associated with a conspicuous aggregation of fat-cells. Later, the adipose tissue

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largely disappears and the submucosa coat becomes denser, narrower, and more homogeneous in appearance, containing relatively few connective-tissue cells.

The reduction in diameter of the entire appendix found in extreme cases of obliteration is associated with still greater contraction and condensation of the submucosa, until the latter is represented by thin fibrous layers in which scattered groups of fat-cells and irregular blood-channels are interspersed.

The first evidences of retrogressive processes within the mucosa consist in diminution of the size, particularly the height, of the lymphatic follicles; after these structures have suffered reduction and lost their fullest expansion, they may remain for a long time as distinct follicles (Fig. 1, *b*, *b*), or, on the other hand, they may rapidly become smaller and, later, almost entirely disappear. The glands of Lieberkühn earliest atrophy in the immediate vicinity of the solitary follicles, a fact to which Rüdinger[1] has particularly called attention.

Subsequent to the pronounced atrophy of the solitary follicles, the mucosa usually suffers a general invasion by lymphoid cells, so that sections of retrogressing appendices often present, next the disappearing lumen, a zone of intensely stained small cells (Fig. 2, *b*), among which lie the remains of the glands of Lieberkühn, as the representative of the mucous coat. Following the disappearance of the atrophic glands, the opposed surfaces of the mucosa may become united and the processes may be so complete that all traces of the lumen and the mucosa become effaced; more frequently, however, the position of the former lumen and the surrounding layer is still indicated by irregular clefts and the zone of lymphoid cells.

The relations between the macroscopic appearances of the appendix and the actual condition of its lumen and walls are not constant; the testimony of both Ribbert and Zuckerkandl, based on the extensive series of appendices examined by these authors, is that not infrequently well-advanced obliteration may exist without being manifested by the external appearances. On the other hand, a marked diminution of diameter, particularly when occurring in usually short appendices, is almost always associated with the changes in question; appendices of unusually large size, however, may be the seat of marked alterations leading to obliteration. Ribbert regards a markedly club-shaped end of the appendix as a fairly certain indication of the obliteration of the lumen, but as to the extent to which the canal has suffered no reliable estimate can be formed from this sign.

[1] Rüdinger, Ueber die umbildung der Lieberkühn'schen Drüsen durch die Solitärfollikel im Wurmfortsatze des Menschen. Sitzungsberichte der math.-physikal. Klasse der König. bayerisch. Akad. der Wissenschaft, Band XXI, 1891.

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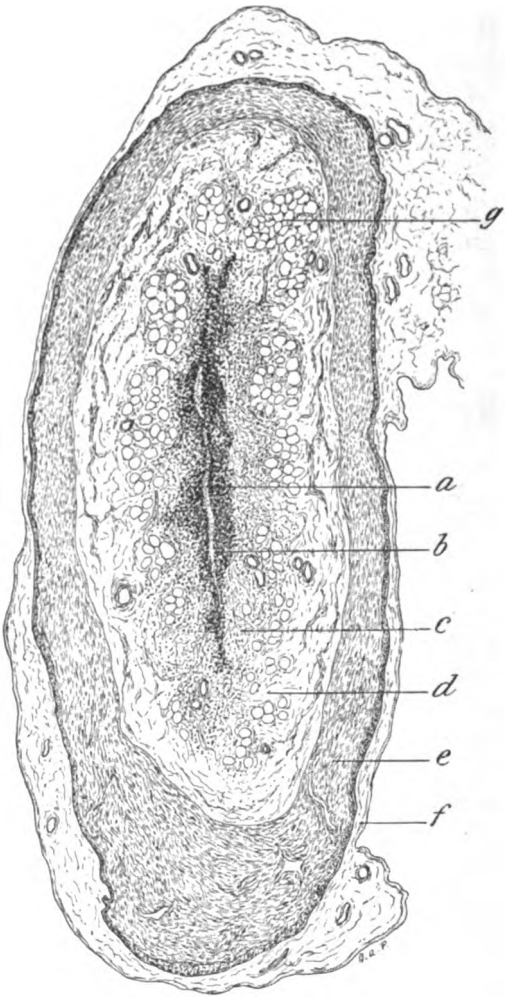
In determining the true significance of these changes which affect so large a proportion of all appendices, several important facts must be borne in mind.

FIG. 2.



TRANSVERSE SECTION OF VERMIFORM APPENDIX OF MAN, AGED 60, MAGNIFIED TWENTY DIAMETERS.

Shows a more advanced stage of obliteration in which the mucosa is represented by the narrow irregular zone of densely crowded lymphoid cells (*b*), surrounding the irregular remains of the lumen (*a*), and the broader, but less deeply stained zone, *c*; *d*, the submucous tissue, still containing numerous fat-cells (*g*); *e*, muscular coat; *f*, peritoneum.

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(1) The great frequency of these changes and the large percentage of appendices affected without external exciting cause.

(2) The absence of indications of inflammatory action.

(3) The typical sequence of the changes, including the initial alterations of the submucosa, followed by the atrophy of the mucosa and subsequent union of the walls of the tube and obliteration of the canal.

(4) The rudimentary character of this portion of the gut and the well-known tendency of similar organs to retrogressive change.

In view of these considerations, the conclusion arrived at by Ribbert, Wölfler, and Zuckerkandl, and accepted also by Berry, that these changes must be regarded as phases of a process of involution, seems the only one tenable. The existence of processes capable of inducing such profound alterations in the appendix entirely independent of inflammatory action becomes a matter of unusual interest in connection with the now so popular removal of the appendix, and it is not improbable that the surgeon, on more than one occasion, has found the assumed justification for an operation of doubtful necessity in the conditions revealed by the examination of a vermiform appendix which was undergoing the involution instituted by nature to effect the obliteration of a useless organ.

DISLOCATION OF THE ACROMIAL END OF THE CLAVICLE, WITH REPORT OF FOUR CASES.

By Thomas H. Manley, M.D.,
New York.

Since the first of the year, 1895, four cases of displacement of the acromial end of the clavicle have come under my notice. The coincidence of so many cases of this special displacement induced me to examine the literature on the subject with a view of determining the relative frequency of it, its morbid anatomy, treatment, and functional results.

My own experience had led me to regard this type of clavicular dislocation as much less frequent than that at the sternal end.

The views of surgical authors on the relative frequency of this variety of displacement and the final results after treatment were found to be most discordant.

For instance, Boyer believed it much less frequent than dislocation of the sternal end. Hamilton and Cooper, on the contrary, were quite positive that the acromial type of clavicular dislocation was the

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more common. Gross stated that it occurred about once for every ten fractures of the same bone. He described three varieties,—the upward, downward, and inward; the first being the most common. Ashhurst declared that there were but six cases of downward displacement of the clavicle on record. Agnew, Liddell, Maglise, and Key designated this injury a "dislocation of the scapula." Liddell believed it to be the most common dislocation. Agnew strangely observed that the downward displacement was the most common, and adds that for some time the upward displacement was denied.

No author stated the relative frequency of the sex in which this accident occurred, or the side of the body commonly involved. All are quite generally in accord on the difficulties in the way of successful treatment, though some imply that these cases are easy of management.

Of my four cases, there were three males and one female. In all the left shoulder was involved, and in all the dislocation was upward. In all, after treatment, there was a more or less marked displacement upward of the head of the clavicle, and a falling inward of the shoulder; but there was scarcely any diminution of the range of motion at the scapulo-humeral junction, or impairment of muscular strength.

Two were consultation cases, seen more than a month after injury, and two were hospital cases, examined shortly after entrance. In the two former, civil suits were about to be instituted.

These four cases of acromial dislocation presented so many interesting and unusual features that it occurred to me, that these injuries deserve a more extended and critical examination than is generally bestowed on them by the average work on general surgery or dislocations.

For instance, we ought to know what the chief factors in causation are: (1) why the bone dislocates rather than fractures; (2) what the extent of restoration will be, under the most approved methods of treatment, and what these were; and (3) the question regarding the ultimate functional utility of the shoulder, in those cases which resist reduction.

We may best answer these questions by first considering the anatomical structures, their functions and relations, the morbid anatomy after injury, and then adding personal experience. This latter is of some importance, I have found, because of the tendency of authors to dogmatize on a special series of cases, which possessed peculiar features and came under their own immediate care; quite often ignoring the opposite opinions of others, whose experience was equal to or greater than their own.

It may be set down as an axiom that, after a dislocation, the extent

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of impairment of function will always be in direct ratio with the diversity of motion and degree of strength in the joint involved.

Now, in order to determine the extent of articular distraint, which so many expect after a luxation, we will do well to view the joint involved from a mechanico-anatomical stand-point.

The scapulo-clavicular junction, though permitting of almost constant motion in respiration and shoulder-action is restricted within a very narrow limit, and is not essential to either.

Anatomically, it very closely approaches a regular arthrodia. Like the shoulder-joint, it rests against a nearly flat surface, but very slightly notched in its centre. Unlike the former, however, it has no muscular or tendinous investment. We sometimes find its capsule bifid, with an intervening fibro-cartilage dividing it. The broad, nearly flat articular surface of the clavicle rests against the outer surface of the acromian process, at a point which would correspond with the head of the coracoid process. It, therefore, lies immediately over the shoulder-joint. Because of its position and relations, it is capable of displacement in three directions in *complete* luxations,—viz., (1) outward; (2) upward; (3) downward.

The joint being entirely devoid of any muscular investment, the bones are maintained in position by a powerful tendino-ligamentous covering. Over it the deep cervical fascia is thick and dense, bleeding and interlacing with the tendinous expansions of the trapesius muscle, which stretches over from the acromial spine along with the thick, overlapping sheath of the deltoid from below. These overlying structures are so knitted and matted together as to fix the joint with all the security that we observe in the tarsus. Besides, this defensive investment from without, we have the coraco-clavicular or sigmoid ligament, which does not immediately include the joint, but yet preserves a firm grip on the clavicular shaft, in such a manner as to draw it downward and hold the head of the clavicle in position. The superior and inferior acromial ligaments, so called by most anatomists, are little more than reduplications of the muscular aponeurosis in the vicinity of the joint.

The clavicle serves the purpose of a shaft, or horizontal brace, to press the shoulder away from the centre of the body and steady it in position. Every motion of the shoulder can be exercised without this joint or even the clavicle, as we know from cases in which this bone has been resected for malignant disease, yet full shoulder-action is maintained.

As bearing on this, I might cite the case of a stevedore, who, while intoxicated, completely fractured his clavicle at its outer third. He left the hospital immediately after the adjustments were applied, and drank more liquor that night; in the morning he tore off all the dressings

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and went to work, where he continued until union was complete. Then, in consequence of the great overriding of the fragments, so large a hyperostosis formed as to compress the brachial plexus and paralyze the arm.

The causes of luxation at the acromial end of the clavicle are mainly two. The first is the predisposing or determining; the other is the immediate or proximate.

With a bone so exposed and situated between two fixed points as the sternum and scapula, we would expect to find luxation here much more frequent. But, we will observe that the clavicular shaft has a double curve, therefore well adapted to resist and diffuse force applied at either end.

In examining several specimens of this bone, we will notice in some the shaft nearly straight and of disproportionate length. This gives configuration of the body known as "broad shoulders." This type is badly calculated to resist great force and readily fractures. In others, again, we will find the sigmoid curve sharply marked, the bone short and very thick. In those we have an inclination to the "round shoulder," but nothing short of great violence will disorganize the bone, though when great force is applied and something must give luxation will probably occur. It has been noted, that, normally, the extent of motion at the acromio-clavicular articulation is very slight, but there are instances in which it is distinctively excessive. In two of such cases, after injury, which have come under my notice, the erroneous diagnosis of fractured clavicle had been made. Probably defect of development, an absence of that well-balanced harmony in growth so essential to articular integrity and perfection, too, contribute this influence.

Active Causes.—These are various forms of physical force,—*i.e.*, something directly striking the body, or the body in a fall coming with great force against some fixed object; concentration of force being spent over the scapulo-clavicular joint.

In clavicular fractures, indirect violence is commonly in operation, but here, in order to tear this bone from its firm attachments, we have every reason to believe that the force must be direct.

The under surface of the acromial end of the shaft is suddenly crowded upward, while simultaneously the shoulder is violently pressed downward and inward.

Diagnosis of this injury should not be difficult, when the head of the bone has been torn from its capsule and its deep ligaments have given way; nevertheless, if one is not cautious in examination error is easy of commission, and we may pass the case off for a sprain or fracture. In shoulder injuries, the general impression prevails that when

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the upper segment of the humerus and the clavicle have escaped fracture, and there is no dislocation of the humeral head, no serious lesion has occurred.

In acromial dislocation of the clavicle, unless we strip our patient and put the shoulder through *various motions*, it may be entirely overlooked. It is my belief that this dislocation is more common than is generally supposed, but, as it is so prone to escape detection and does not materially affect function, it is overlooked. In two of my cases it was not recognized until some weeks after the injury, and then, only, on a critical and special examination.

It seems highly improbable that it should be confounded with a scapulo-humeral dislocation ; clavicular fracture or a fracture through the acromial end of the scapula. In the latter, as the acromial flange of bone is firmly held in place by the muscles, extensive displacement, as in pelvic fracture, is quite impossible.

The only injury in this anatomical district which at all simulates it is a fracture through the acromial end of the clavicle, or epiphyseal separation in the growing immature subject.

Morbid Anatomy.—In all these cases the act of dislocation completely tears away the capsular envelope, and thus totally destroys the joint.

In all cases the acromial ligaments are probably ruptured, and if the sigmoid escapes, it is only at the expense of extensive laceration or stretching, for, without this, the extent of displacement which we encounter would be impossible.

When the head of the bone leaves its mooring it rises upward and forward. A downward displacement is impossible, for it is absurd to imagine the head of the bone being driven into the articular end of the humerus, above which it rests. We can conceive of a backward dislocation, but, as it here would be driven into the fibres of the trapezius, it is very improbable.

After dislocation occurs, as this joint is wholly free of a muscular investment, the head of the bone remains in the position that it has been forced into.

It is a mistake to suppose that either the deltoid or trapezius in any manner influence the position of this bone in their passive state, though, indirectly and in a minor degree, the subclavius and pectoralis major do.

As the head of the bone rises upward it produces a painful pressure against the skin and a marked deformity. However, by raising the shoulder and carrying the scapula up to the under surface of the displaced bone, every visible trace of deformity is usually, for the time, obliterated. As this position affords the injured, after the accident, the

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most comfort and relief from cutaneous irritation, it is generally maintained.

If we view the body naked, of one so injured, we will observe that there is a falling downward and inward of the affected shoulder. After a month or two we will generally observe a well-marked atrophy of all the muscles which have a scapular origin.

It may be, perhaps, that the degree of shrinkage in muscular volume is no greater in this than in other shoulder dislocations, and that after the parts have accommodated themselves to the maladjustment the shrunken tissues may recover their normal contour and strength; but of this, in the cases here reported, sufficient time has not elapsed to permit me to determine.

My own conviction is that, as there are no important nerve-trunks or vascular channels contiguous with this articulation, no serious or permanent impairment of function can follow a luxation of it, unless there are other complications present. The truth probably is that, after this dislocation remains a time, as in clavicular fractures, which seldom unite without some overriding of the fragment and deformity, there will be a compensatory adjustment of the adjacent structures, with practically no impediment in the ultimate utility of the limb.

Its presence, usually, rather implies the application of great violence to the body than any serious, permanent damage to the shoulder.

In dislocations at the principal articulations of the extremities, once reduced, muscular action over them, or through the tendons, aids greatly in holding the reduced bone in place; while here it indirectly prevents perfect repose after replacement.

Marked downward displacement has no existence, for apparent physical reasons. Such displacements, described by various authors, applied only to the scapula, which they always regarded as the luxated bone in this class of cases.

The permanently dislodged head of the bone in this dislocation pressing against the integument is a cause of pain and irritation, which becomes less after it is finally fixed; and, as we might expect, the full, free action of the shoulder is, in a marked degree, restricted.

Treatment of an acromial dislocation of the clavicle is highly unsatisfactory.

We cannot return the dislodged bone into an articulation which does not exist, for the arthritic structures must necessarily suffer quite complete disorganization in this injury.

The natural tendency of displaced fragments in fracture of the heads of bones and in dislocations, is for them to remain in their normal position, after replacement with moderate support. A knowledge of this fact will point the way to the most efficient mode of treatment,—

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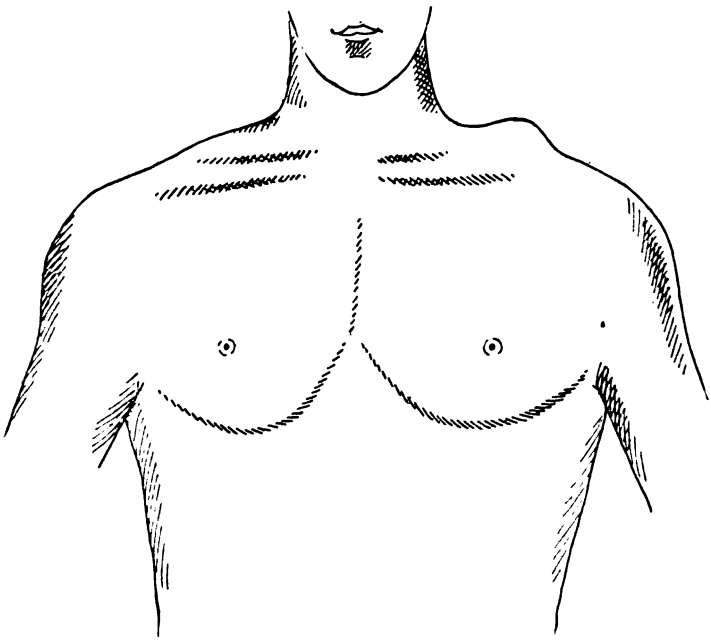
viz., prompt replacement or reduction with such support as will hold the luxated head of the bone in place until such adhesions have formed as will hold the parts together.

However, as few will or can endure the irksome restraint of protracted fixation of the shoulder, union of the overlying arthritic structures will rarely succeed, hence more or less deformity is liable to follow.

In devising an adjustment we should be guided by the special indications of a given case rather than select any specialized apparatus. In no case is there any use of persisting with any descrip-

FIG. 1.



tion of apparatus or dressing for more than one month. Deformity in varying degrees will follow; happily, frequently with little more inconvenience to the patient than when moderate deflection or shortening succeeds in various fractures of a bone shaft.

HISTORY OF CASES.

CASE I.—Patient, a male, aged 51 years, was injured December 12, 1894. On this date, while passing through an avenue, the wind blowing hard, he was struck violently on the shoulder by a heavy store-sign which hung over the sidewalk.

The shock of concussion was so great that he was unable to rise;

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when an ambulance was called and he was brought to the hospital. Here he was treated for "general contusions," retained a week and discharged. But his left shoulder remained weak, and in vain he applied liniments and salves, the impediment in motion remained.

Early in March, 1895, he was sent to me for examination by Dr. Frank McGuire, into whose hands he had now come.

With the chest bared, and by inducing various motions at the shoulder, it was easy to detect the pronounced displacement of the acromial end of the clavicle, which was raised upward and forward, producing a bulging forward of the integument at the point where it was fixed.

In this man's case, on measurement, there was found a general wasting of all the groups of muscles, from the shoulder downward. Whether this atrophic state resulted from non-use of the limb or direct injury to the nerves at the time of the accident was not clear.

In this case the head of the clavicle was so raised, with the shoulder depressed and inclined inward, as to produce a moderate notching on the surface of the integument (Fig. 1).

CASE II.—Patient, a female, aged 51 years, was seen by me, March 12, 1895. Eight weeks previously the patient was in a street-car that had become unmanageable while descending a sharp incline; the braking-gear gave way, the car being overturned on a curve under a hill. Several passengers were seriously injured. This lady had suffered an extensive scalp-wound, a violent wrench of the shoulder, and a bruising of the whole body.

She was a woman, at the time of injury, weighing over 200 pounds, of a large frame, and full muscular development.

When I was called in she had lost much in flesh, in consequence of erysipelas developing in the scalp and spreading over the entire head.

Besides bodily weakness, now her constant complaint was a painful, weak, and stiff shoulder.

On inquiry she informed me that her shoulder had been treated for a "sprain" only, that there had been no dislocation nor fracture. She removed all her garments from the injured shoulder, which, on first inspection, presented nothing abnormal. Being very fat, the framework of the shoulder was deeply buried, and it was only when I depressed the shoulder that the displaced end of the clavicle came into view.

For considerable area about this there was a noticeable tumefaction and tenderness on motion or pressure. When the arm was pressed upward and the trunk well fixed, the deformity was well-marked and characteristic (Fig. 2).

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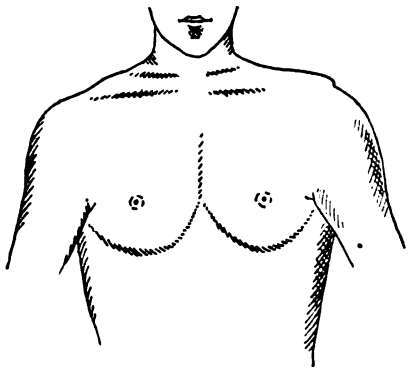
By allowing both shoulders to drop and slightly inclining the body, every trace of deformity disappeared.

CASE III.—Patient, a boy, aged 14 years, seen March 27, was injured by a fall from a vendor's wagon, and striking on his shoulder.

After the injury, as his arm on the affected side was quite helpless, he was sent to the hospital. He was seen by me on entrance.

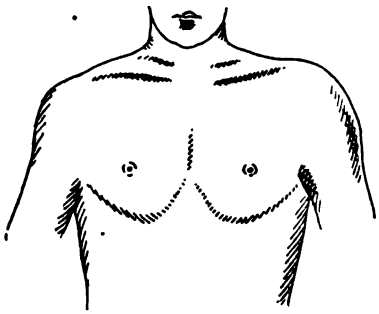
FIG. 2.



Having within a brief period seen the two preceding cases, I was induced to critically examine his shoulder.

Unlike the other two cases, there was scarcely any visible deformity. It was only when the arm was raised that the luxation was easy of detection (Fig. 3).

FIG. 3.



The ligamentous detachment was quite complete, but the muscle-fibres were so intact as to most effectually hold the bone in close relation to its lacerated capsule. As this lad left the hospital before the end of the first week and did not return, the final extent of impairment in function could not be ascertained.

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CASE IV.—Patient, a male, aged 43 years, entered hospital September 14, a carpenter, was injured by a piece of lumber falling about ten feet and hitting him on the shoulder. He was knocked down and unable to rise. When he was brought in by the ambulance he was yet in great shock. On examination on admission, nothing specially wrong was discovered about the body, though it was only partial, owing to his general condition.

He gradually recovered his strength and ability to walk about. In this case, as it was only by making a critical examination on the third day after admission, a distinct upward and forward clavicular dislocation was found. Its general characters were similar to the first case.

The luxation was treated by the Boyer bandage, the shoulder being fixed for six weeks; nevertheless, at the end of that time, although the tendency to forward riding of the clavicle was greatly reduced, yet some deformity remained.

Now, ten weeks after the injury, he says he has the full strength of the shoulder and suffers none from pain or stiffness on motion.

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Maglise: Shoulder Dislocation, Lancet, May, 1872.

THE relative standing of the graduates of the various medical colleges, examined by the State Board of Medical Examiners, representing the Medical Society of the State of Pennsylvania, June 18 to 21, 1895.

Medical College from which Applicants Graduated.	Number Examined.	No. Failed.	Percentage of Failures.	Average Grade.
University of Pennsylvania	136	1	0.73	86.41
Jefferson Medical College	65	3	4.68	85.28
Medico-Chirurgical College, Philadelphia	41	5	12.19	80.65
Western Pennsylvania College, Pittsburg	61	9	14.92	80.68
Baltimore Medical College	4	1	25.00	81.58
College of Physicians and Surgeons, Balt.	24	6	25.00	81.00
Woman's Medical College, Philadelphia	26	7	26.92	80.01
Miscellaneous Colleges	33	9	27.27	79.16
Total	390	41	10.48	83.83

Highest average obtained, 94.86.

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SOME SEQUELÆ OF TYPHOID FEVER.[1]

By Thomas D. Dunn, M.D.,

Physician to Chester County Hospital, West Chester, Pa.

As it will be impossible, within the limits of a ten-minute paper, to critically consider all the sequelæ of typhoid fever, these remarks will be confined to a few striking cases which have come under my personal observation.

I. Erythema Nodosum.

(1) J. M., aged eight years, had a mild attack of typhoid fever in March, 1886, the febrile state lasting less than two weeks. She was then taken to the sea-shore, returning in a week with a temperature of 103° F., and complaining of rheumatic pains and loss of appetite. Twenty-four hours afterwards erythematous nodes appeared along the tibiæ, two on each thigh and several on the forearms. The temperature ranged from 99 to 101 for twelve days. Recovery took place without suppuration.

(2) A girl, aged six years, had a light attack of enteric fever which lasted about two weeks, and was free of complications. Highest temperature, 103° F. Ten days after subsidence of fever, the temperature suddenly rose to 102⅔°, it was associated with rheumatic pains, and was followed by red, purplish nodes along the tibiæ and on thighs. Fever of mild grade lasted about two weeks. Recovery ensued without abscesses.

(3) A. E., aged nineteen years, contracted typhoid fever in April, 1890. The fever lasted thirty days, and was complicated with bronchitis. There was considerable delirium and meteorism. Temperature ran a typical course. After he had been up several days, and convalescence seemed thoroughly established, he complained of a feeling of malaise and rheumatic pains with a return of fever. Nodes of erythema appeared on the tibias and thighs. This ran its course in three weeks, after which he was able to go out on the lawn. After an apyretic interval of two weeks, he had a periostitis of the right tibia and clavicle which lasted nearly a month, the tibial inflammation terminating in an abscess. He ultimately made a good recovery.

The cases of erythema were treated with salines and salicylate of quinine during the febrile stage, and during convalescence with iron and arsenic. The diet was carefully regulated, and anodyne applications were made to the nodes.

Erythema nodosum is rare, but probably more common than sta-

[1] Read at the meeting of the Pennsylvania State Medical Society, May 21, 1895.

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tistics seem to show. As I have seen no reference to it as a sequel of enteric fever, it is possible that their connection may have been accidental. It is remarkable, however, that in an experience of only nine cases, three should have followed typhoid fever.

If the opinion advanced by Bohn, that each of these nodular tumors is an inflammatory infarction, caused by embolism in the cutaneous vessels, be correct, the post-typhoid state is certainly a favorable condition for the development of erythema nodosum, and in children, at least, a predisposing cause.

II. Arterial and Venous Thrombosis.

(1) Dr. J. D., aged twenty-seven years, contracted typhoid fever in February, 1891. The fever subsided in two weeks, and some doubt was entertained as to the diagnosis, but after three days of almost normal temperature, the fever returned—the temperature often rising to 104°, 105°, and once to 106° F.—and lasted three weeks, with well-developed symptoms. It was complicated by a sharp attack of congestion of the left lung. About forty days from the beginning of his illness, the right thigh became painful, accompanied with tenderness and swelling of the entire limb.

Recovery from this was slow, it being fully two months before the swelling subsided. The treatment consisted of anodynes over the femoral and saphenous veins, bandaging the limb, and, later, mild counter-irritation. Tonics and alternatives were also used during convalescence.

(2) F. H., aged thirty-six years, was seen in consultation with Dr. Massey in the autumn of 1882. He had been for years a sufferer from rheumatism and valvular disease of heart. The attack of typhoid fever was rather mild, but soon after the subsidence of the fever, the patient complained bitterly of pain in the right limb, which became extensively swollen, and gangrene set in. Two weeks before death, he had sharp pain in the region of the spleen, which was tender and enlarged. This was associated with several distinct rigors. The autopsy showed mitral valvular disease with some hypertrophy, congestion, and enlargement of the kidneys and liver, and arterial thrombosis of the right femoral artery. The spleen was four times the normal size, and fully one-half was involved in an abscess. Other organs healthy.

III. Post-Typhoid Abscess and Parotitis.

A lad, ten years of age, was admitted to the Children's Hospital, Philadelphia, June, 1882, while I was resident physician under the late Dr. Jas. H. Hutchinson.

His attack of typhoid was attended by high temperature and

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active delirium. During early convalescence, a dozen or more abscesses developed on the legs, arms, and body. He also had a suppurative parotitis on the right side. These extended over a period of three weeks. There were slight febrile disturbances during the formation of the abscesses, together with great restlessness, peevishness, and loss of appetite. After they ceased to form, and two weeks after the fever ceased, he passed into a state of mental dulness and aphasia. An effort to arouse him would bring forth a feeble whine. He was fed with a spoon with much difficulty. Speech slowly returned, and a good recovery followed.

Vincent[1] in a series of forty-one cases of enteric fever, in which suppuration appeared, found the secondary lesions in thirty-two cases due to staphylococcus aureus, or the mixed infection from the staphylococcus aureus and albus.

All of these cases recovered.

In eight cases, streptococci, in association with the typhoid bacillus of Eberth, were isolated from the purulent forms. Five of these died, and he considers complications very grave in which streptococci appear, and when they are detected following enteric fever, energetic treatment should be used.

He suggests that attention should be given to the hygiene of the skin, in order to diminish the risk of such infection.

IV. Affections of the Nervous System.

The concluding nervous condition of the preceding case is an interesting phase of brain exhaustion of which I have seen several instances.

(1) R. H., aged twelve years, was first seen August 8, 1892. She had the text-book symptoms of typhoid. The temperature rose frequently to 105° F. Cold sponging and packs were less successful in reducing it than is usual in children. The febrile state, which lasted twenty-four days, was attended by less delirium and nerve disturbance than usual. After a quiet, apyretic period of four or five days, the patient became speechless, would not respond when spoken to, or change her position in bed. Nourishment was quickly swallowed when placed in her mouth. The discharges were passed involuntarily. After one week she began to take notice of her surroundings and enjoy food. Speech gradually returned, first in monosyllables, then phrases and sentences. She made a slow but good recovery.

(2) R. N., aged ten years (seen in consultation with Dr. Massey), had a decided attack of typhoid in the spring of 1885, which lasted about three weeks. A few days after the fever ceased, the rather list-

[1] Annales de l'Institut Pasteur, Paris, February, 1894.

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less condition which had been present passed into absolute speechlessness. He would lie in one position and could not be aroused; would only swallow food when it was placed in his mouth, and his jaw pulled forward or head shaken. This was persistently carried out for a number of days. Consciousness gradually returned, and convalescence followed without further sequelæ.

(3) Mrs. R., aged thirty-eight years, had enteric fever in the spring of 1889, the fever lasting twenty-nine days. The height of the attack was not attended by much delirium, headache, or nervous symptoms. As the fever subsided, she remained in a listless state and took nourishment only when forced to do so.

During this period she took an ounce of laudanum from an adjoining room in the absence of the nurse. The prompt use of the stomach-tube prevented the absorption of a fatal amount. Under nutritious diet, strychnine and iron, the melancholia gradually disappeared, and she made a satisfactory recovery.

(4) Mrs. M., an anemic and neurasthenic woman of twenty-six, contracted enteric fever in March, 1894. The pyrexia lasted fourteen days, and all symptoms were mild. One week without fever was followed by a relapse which lasted twenty-eight days. It was accompanied by sustained high temperature, great mental excitement, and insomnia, without much delirium. Ten days after the fever of relapse ceased, she had a period of melancholia and marked listlessness, and ate and slept but little. Emaciation and anemia were marked, but disappeared under iron, arsenic, strychnine, and liberal feeding, and with them her melancholia.

(5) D. A., aged thirty-two, seen in consultation, had enteric fever which ran a typical course, and the fever ceased at the end of the third week. The patient was a neurasthenic dyspeptic, subject to fits of depression. During the post-febrile stage, in which he slept badly and ate little, he looked most dejected and expressed much disappointment when told he would recover. He was very anemic, pulse feeble, and extremities often cold and clammy.

During the momentary absence of his nurse, he took a drink of corrosive sublimate solution, which produced a fatal gastro-enteritis.

In this class of cases the force of the disease seems to be spent on the cerebro-spinal system, and is doubtless due to impaired nutrition and exhaustion of the nerve centres,—the result of prolonged high temperature.

This explanation will also account for the various forms of post-typhoid neuritis, as well as the neurosis known as the "typhoid spine," which has been so well described by Dr. Gibney, of New York, and Dr. Osler, of Baltimore.

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The treatment of these cases consisted of a highly nutritious and easily assimilable diet, strychnine and iron tonics, and every measure possible to secure rest to the exhausted nerve centres.

The modern hydropathic treatment of the febrile stage of typhoid will lessen the frequency as well as the severity of such complications, by diminishing nerve exhaustion. Cases of post-typhoid melancholia and insanity usually recover, and the friends should receive a hopeful opinion as to the result. They should be most carefully watched and not committed to an insane asylum, if it is possible to care for them outside.

ABSORPTION FROM THE BLADDER, URETHRA, AND VAGINA, WITH SOME NOTES ON ABSORPTION FROM MUCOUS MEMBRANES IN GENERAL AND SOME EXPERIMENTS ON THE EFFECTS OF PRESSURE ON THE BLADDER.[1]

By Joseph P. Walsh.[2]

I. Introductory.

On November 27, 1893, Dr. P. Bazy,[3] in a note presented to the Academy of Medicine, of Paris, on absorption through the urinary tract, asserted that, notwithstanding the almost unanimous agreement of physiologists that it did not absorb, or so very slightly as not to be worth noticing, the vesical mucous membrane did absorb, and that, too, almost as readily as the cellular tissue. His experiments were made on dogs and rabbits with prussic acid, cocaine, strychnine, curare, and pilocarpine. In November, 1894, there appeared in the same journal an article by Dr. J. Boyer and L. Guinard, impeaching the value of the results obtained by Dr. Bazy, and reasserting the physiological impermeability of the healthy bladder. They say, "All the physiologists are unanimous in recognizing the impermeability of the healthy vesical epithelium. It is a classic truth that was formerly much discussed,

[1] The thesis to which was awarded the one-hundred-dollar prize for the best original research in physiology, presented by a member of the graduating class of the Medical Department of the University of Pennsylvania, June, 1895.

[2] The writer has to thank Professor Piersol for information and references with regard to epithelium and lymphatics; Professor Marshall for some suggestions as to the method of performing the experiments; and Dr. Carter, who was engaged in other works in the laboratory during a number of our experiments, for material aid and kindly suggestions. A special word of thanks must be briefly, but sincerely, offered to Professor Reichert for his cordial encouragement and for valuable hints which he has at all times generously given.

[3] Archives de Méd. exper. et d'Anat. pathol., July, 1894.

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but with regard to which every one is now agreed." Their conclusions are supported by a series of experiments on dogs which they detail. The subject seemed worth investigating, hence the present paper.

The general impression among medical men certainly is that the bladder does not absorb. The reason for the impression can, I think, be best stated in Picard's[1] words, that it would be absurd to think that after nature had provided a complicated mechanism for the excretion of noxious substances from the system in the kidney, she should provide a receptacle for them lower down in the urinary tract through the walls of which it would be possible for them to get back into the system once more. The subject has not been left entirely to *a priori* reasoning, however. A number of experiments have been made, and it is only surprising that the question has not been definitely settled long before this. As long ago as 1824, Segalas[2] found, after a series of experiments on dogs, "that absorption of some medicinal substances from the bladder takes place as rapidly as from the stomach." In 1862 Segalas,[3] Jr., repeated his father's experiments on rabbits, and confirmed his conclusions. In 1867, Demarquay,[4] and after him Hicks,[5] from observations on the bladder in morbid conditions, asserted its absorptive power. Later in the same year Thompson[6] denied it.

Bert and Jolyet[7] announced the results of their experiments on animals before the Société de Biologie de Paris in 1869. They found that absorption does take place. In the discussion that followed Claude Bernard and Brown-Séquard expressed agreement with their conclusions. The following year[8] they returned to the subject in a note to the society, and stated that, after tying off the urethra close to the bladder, absorption did not take place, and concluded that it was the urethral, not the bladder epithelium that absorbed. In 1868, Küss[9] did a series of experiments, which were taken up in his laboratory a few years later by Susini[10] and confirmed by him. They injected into the bladders of dogs just dead a solution of ferrocyanide of iron, and then painted the peritoneal surface of the bladder with an iron salt. No blue staining appeared until from two to six hours afterwards unless the vesical epithelium were intentionally injured, when it appeared at

[1] De la Présence de l'Urée dans le Sang, Strasbourg, 1856.
[2] Journal de Physiologie de Magendie, Vol. IV, p. 285.
[3] Thèse de Paris, 1862.
[4] Union Médicale, 1867.
[5] Lancet, June, 1867.
[6] Lancet, October, 1867.
[7] Comptes Rendus de la Société de Biologie, 1869.
[8] Comptes Rendus de la Société de Biologie, 1870.
[9] Manuel de Physiologie, 1875 (2d edition).
[10] Journal de l'Anatomie, 1868.

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once. Curiously enough, it is these experiments that are quoted by physiologists rather than the experiments of Susini, performed by directly injecting substances into his own bladder and those of dogs. He injected KI into the bladders of dogs and failed to find traces of it in the saliva. He injected the same drug and belladonna into his own bladder and failed to get either reaction or symptoms.

Alling[1] found, as did Bert and Jolyet, that after tying the neck of the bladder, he failed to get absorption, and he, too, attributed the discrepancies in experiments to the fact that it was from the urethra, not the bladder, that absorption took place. Cazeneuve and Livom[2] made a series of experiments of an entirely different kind. They studied dialysis through the bladder walls by plunging a bladder full of urine into warm distilled water immediately after the death of the animal, and then testing the water around it after a suitable interval for urea. It took three to four hours to pass through if the animal was just dead before its removal, but if a short time intervened urea was found in the water outside in a few minutes. Later, Cazeneuve, with Lepine, found on ligaturing the urethra and ureters that four centigrammes of strychnia injected through a fine canula caused no effect for ten to eighteen hours. Symptoms of poisoning developed, then, and the animal died.

Ashdown,[3] in 1886, found in a series of forty experiments on rabbits that many medicinal substances are absorbed by the healthy vesical mucous membrane. He got absorption of strychnia, eserine, ether, chloroform, morphia, atropia, curara, hydrocyanic acid, and cyanide of potash.

Susini had failed to find KI in the saliva; Ashdown, after injecting it into the bladder, carefully turned out a ureter and demonstrated its elimination by the kidneys. In 1892, Guyon and Albaran[4] adopted the opinion that the vesical mucous membrane when healthy is absolutely impermeable. Finally, Duval[5] says that, "from the physiological point of view the vesical mucous membrane is remarkable for its impermeability. It absolutely prevents resorption." He then refers to Küss and Susini's experiments, and their failure to get a blue color with ferrocyanide in the bladder and a salt of iron on the peritoneal coat. In a note there is reference to Cazeneuve and Livom's observations on dialysis through the removed bladder walls. These are supposed to prove that absorption does not take place.

[1] De l'Absorption par la Muqueuse Vesico Urethrale, Paris, 1871.
[2] Revue mensuelle de Médecine et de Chirurgie, 1879.
[3] Journal of Anatomy and Physiology, 1886 and 1887, p. 299.
[4] Pathological Physiology of the Retention of Urine.
[5] Traité de Physiologie humaine, edition of 1893.

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Duval's work is looked upon as a classic in France, so that the subject of absorption from the bladder is not a settled one, and another series of experiments may do something towards helping to settle what seems yet a vexed question.

II. Experiments.

The experiments were done on different sized dogs in the Laboratory of Physiology of the University of Pennsylvania. Except in the first experiment, where a No. 6 red-rubber catheter was used, a No. 3, 4 and 5 flexible catheter, according to the size of the dog, was employed. The stylet was not used with the catheter, and the instrument was always dipped in warm water and thoroughly greased with vaseline before insertion. Except in the first experiment the animals were not tied, and usually gave scarcely any signs of being disturbed by the manipulations. A small dog, on whom several experiments were done, would jump up on the table and, when put in position, hold its leg in the air while the catheter was being passed. The animals were always allowed to run around for a time until they urinated, before the experiment was begun. Drugs injected into the bladder were always well diluted and the solution, except in the first few experiments, was always about blood-heat. In this way we never had any trouble from the premature ejection of the fluid. Usually between fifteen and twenty-five cubic centimetres of solution were used for an injection.

In making our experiments on the bladder, it was necessary, of course, to use drugs that gave easily recognizable signs of their physiological effect. We did not consider it necessary to use a great variety of drugs, however, for surely no one would attribute a selective action to the bladder epithelium; and it is more than probable, if it allows the passage of any one of a series of drugs that are ordinarily soluble and diffusible, it will allow the absorption of any other. The bladder was not meant by nature to possess any special absorptive function, and we thought it justifiable to assume that it would therefore absorb less readily than any of the other mucous membranes. The dose by the mouth is usually considered in practice to be twice the dose by the vein, the rectal three times, and we thought it not unfair to assume at once that at least four times the dose by the *vein* would be required to affect the animal when injected into the bladder. We may say at the beginning that, employing such a dose, we never failed to get the physiological effect of our drugs, and even with smaller doses secured easily noticeable symptoms of their absorption.

Experiment I.—Dog, 13 kilos. A No. 6 soft-rubber catheter was passed gently into the bladder; as the dog had urinated just previously, only a few drops of urine came away. One gramme of sulphate of

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atropine dissolved in twenty-five cubic centimetres of water was thrown gradually into the bladder and the catheter allowed to remain. This dose was about four times the minimum fatal dose by the vein in dogs. Many dogs, however, standing a much larger proportionate dose. Ten minutes after the introduction of the drug the respirations became rapid and labored, and the pulse went up to 150. At this time the pupils failed to react to light. The experiment was carefully and repeatedly tried, so that the well-known tendency of the dog's pupil to dilate under excitement or after struggling might not be mistaken for the effect of the drug. The respirations became more rapid and shallow, and at twenty minutes after the injection the catheter was withdrawn. Five minutes later the dog urinated. He was then released. He was unable to stand up, his legs spreading out under him when he attempted to walk. He looked longingly at water, and plunged his head into it, but withdrew it at once, his respiration requiring all his attention. The dilatation of the pupils remained for five or six days. The dog never was himself again after the injection. His appetite remained poor, he gradually grew weaker, and after twenty-four days died. This result is interesting as coinciding with the result of one of Bazy's experiments with belladonna on rabbits. The immediate effects in his case were limited to dilatation of the pupils, but the animal died after five weeks of gradual decline.

Experiment II.—We then tried half the proportionate dose used in the first experiment. Into the bladder of a dog, weighing 27 kilos, one gramme of atropine sulphate, dissolved in about twenty cubic centimetres of water, was injected. The injection was followed by ten cubic centimetres of water, to be sure there would be no dripping into the urethra during the withdrawal of the catheter. The instrument was immediately withdrawn and the dog allowed to walk around. After nine minutes there was complete dilatation of the pupils and failure to respond to light. This seemed to be all till about forty minutes after the injection, when he became unsteady on his legs and showed some disturbance of breathing; the respirations became shallower and more rapid. His pupils remained dilated for several days, and for a week he was in low spirits and did not have much appetite.

Experiment III.—Then one-quarter the proportionate amount was used,—that is, the usual minimum fatal dose by the vein was given. Dog, 8 kilos. Two grammes of atropine sulphate in fifteen cubic centimetres of water were injected. A No. 3 flexible catheter was used. The dog did not require to be held and did not seem disturbed by the instrument. After twelve minutes dilatation of the pupils was noted. No other symptoms for sixty-five minutes, when there was considerable uneasiness and restlessness developed that we thought attributable to the drug.

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Experiments with Apomorphine.—The apomorphine was in the form of tablets of the hydrochlorate one-tenth grain each, intended for hypodermatic injection, and therefore absolutely unirritating.

Experiment IV.—Large dog; weight, 56 pounds. Two-tenths of a grain of hydrochlorate of apomorphine in fifteen cubic centimetres of water were injected. No result.

Experiment V.—Two days later. Five-tenths of a grain was followed by severe vomiting after eleven minutes and seemingly nausea for a long time after.

Experiment VI.—Dog; weight, 32 pounds. Three-tenths of a grain of apomorphine produced emesis in thirteen and a half minutes.

Experiment VII.—Dog; weight, 21 pounds. Two-tenths of a grain of apomorphine injected; emesis in eleven minutes. The three successful experiments, Nos. 5, 6, and 7, are exact counterparts of each other, and were done with careful precautions, to avoid any complications that might make the experiment doubtful. To make sure that there was no leakage into the urethra, a suitable catheter, a No. 6 flexible in Experiment V, a No. 5 in Experiment VI, and a No. 4 in Experiment VII was used. The results of these experiments really put beyond all doubt for us the conclusion that the perfectly healthy dog's bladder does absorb at least apomorphine. The dogs used in Experiments VI and VII were used, after the lapse of a week, for two experiments with strychnia. As the substance used in the former experiment had been absolutely unirritating, and as there was no sign of any irritation of the bladder by the drug, we felt that it would not lessen the value of the results.

Experiment VIII.—Dog, 15 kilos. Injection of 0.01 gramme of strychnia sulphate in twenty cubic centimetres of water. After fifteen minutes, restlessness and some muscular twitching; after eighteen minutes, a stilted walk, what the attendant in the laboratory called a "spring halt;" after twenty minutes, the urine was forcibly ejected without the adoption of the usual position.

Experiment IX.—Dog, 10 kilos. Injection of 0.005 gramme of strychnine sulphate. After twenty-two minutes, muscular twitching and unrest; after twenty-eight minutes, some stiffness of limbs in motion; no further symptoms noticed.

Ashdown had succeeded in inducing anesthesia in rabbits by the injection of ether and chloroform into the bladder. Four experiments were done on dogs to see if it were possible to produce the same effect. In Experiments X and XI, ten cubic centimetres of ether and five cubic centimetres of chloroform, respectively, in emulsion with castor oil to make them less irritating, failed to produce any noticeable effect.

Experiments XII and XIII.—Twenty cubic centimetres of ether

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and ten cubic centimetres of chloroform a week later, in emusion with almond oil, gave a primary stage of quiet, but not complete anesthesia. The odor of the drug could be detected distinctly on the breath in each case. Considerable irritation seemed to be set up, especially by the chloroform, and Dr. Carter's suggestion, that as the result of this irritation the current in the lymphatics, as in irritative processes generally, would be towards the irritated part rather than away from it, may account for the failure to absorb enough within a given time to produce anesthesia in an animal as large as the dog.

Experiments XIV and XV.—We repeated Ashdown's experiment with ether and chloroform on the rabbit and succeeded in getting complete anesthesia with both drugs. A No. 3 flexible catheter was introduced seemingly with no inconvenience to the animal. Curiously enough, while we had difficulty in catheterizing a bitch we had none with the female rabbit. The animal into whom five cubic centimetres of chloroform had been injected recovered from the anesthesia after about twelve minutes, though it was very unsteady in its gait for over an hour after. Next morning it was dead.

Susini failed to get the reaction for iodide of potash in the saliva after administering it by the bladder. Ashdown demonstrated it in the urine, however, after injecting into the bladder a solution of it of the same strength as Susini had used. Ashdown turned out the ureters and received the urine in porcelain capsules containing starch and chlorine water, the blue color showing the presence of iodine after an average time of seventy minutes.

We first tried it by the stomach to be sure that we would be able to demonstrate it in the saliva by the ordinary starch-paper and acid-test.

Experiment XVI.—Dog; weight, 8 kilos. Two grammes of KI by the stomach-tube. After fifty minutes, test of saliva made with starch-paper and HCl. The dog's mouth was held open and the paper soaked as thoroughly as possible with saliva. The first test gave no reaction, and the tests were continued each ten minutes until eighty minutes after administration, when a distinct reaction was obtained. Then it was tried by the rectum.

Experiment XVII.—Bitch; 11 kilos. Three grammes of KI (after washing out the rectum with soap and water) injected high up,—that is, about ten inches from anus. After failure to be retained the first time, it was retained on a second trial, and the reaction obtained in the saliva after 110 minutes. We were now ready to look for it from the bladder.

Experiment XIX.—Dog; 15 kilos. Five grammes of KI, in twenty cubic centimetres of water, injected into bladder; distinct blue

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reaction in saliva after 150 minutes. In view of the fact that decomposing urine in cystitis case often sets free ammonia and other deleterious gases whose absorption would seriously affect the system, it seemed desirable to test the absorptive power of the vesical mucous membrane for gases present in the bladder.

Experiments XX and XXI.—A catheter was attached to a hose leading to a bottle containing ether and chloroform in these two experiments, and the bottle placed in warm water till gas was evolved. With chloroform, there was first a stage of excitement, perhaps due to the irritation of the vapor; then a condition of quiet with automatic breathing and the odor of chloroform distinct on the breath, but not complete anesthesia. With ether, about the same result only that the preceding irritation was not so marked. Nearly twice as much of the drug was used, and it took longer to get the quiet stage and the odor on the breath. That the drugs were in the bladder in the state of gas was clear, for near the end of each experiment the vapor found its way out alongside the catheter and made slight puffing noises. These puffing noises occurring about two and a half to three minutes apart, we attributed to the intermittent contractions of the bladder that have been observed and commented on by a number of experimenters.

To test, if possible, what effect irritation had on absorption from the bladder, apomorphine was injected into the bladder of the dogs to which the ether and chloroform had been given.

Experiment XXII.—Dog in which three-tenths of a grain of apomorphia had caused vomiting in thirteen and a half minutes. About one hour after ether injection into bladder, the same amount caused vomiting only after seventeen minutes.

Experiment XXIII.—Dog in which two-tenths of a grain of amorphine had produced emesis in eleven minutes, after chloroform the same dose was followed by emesis in eighteen minutes.

Experiment XXIV.—Dog into which ten cubic centimetres of emulsion of turpentine and almond oil (two to eight) was injected, followed after a half-hour by five-tenths of apomorphine. This dose had caused emesis in eleven minutes before, and now required fifteen minutes.

Guyon and his school experimenting on dogs found that by tying the penis, and so allowing the urine to collect in the bladder for eight to ten hours, a catarrhal cystitis was set up. To see what effect this would have upon absorption, ten days after the above experiments it was tried in the two dogs of Experiments XXII and XXIII (above). The dogs were in excellent health, seemingly; made their water just before going on the table for the ligature, and the urine seemed normal in character. The ligature was applied at 9 A.M. over a fold of gauze

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just tight enough to occlude the urethra, but not enough to shut off the blood-supply. Neither dog seemed to suffer much inconvenience from it. At 5 P.M. the ligature was removed and the dogs permitted to run around to allow them to urinate. One of them did so at once, the other was assisted by the passage of a catheter.

Experiment XXV.—Dog in which originally three-tenths of a grain of apomorphine was followed by emesis in thirteen and a half minutes. After distention of the bladder, as above described, same dose caused emesis in six minutes.

Experiment XXVI.—Dog in which two-tenths of a grain of apomorphine gave emesis in eleven minutes. Same dose, after retention of urine for nine hours, emesis in five and a half minutes.

These few experiments on the irritated and distended bladder are rather suggestive than conclusive. If it were allowed to generalize from experiences so scanty, they would point to some interesting conclusions. Unfortunately, time would not allow us to follow the subject up as we would have wished. The hyperemia incident to acute irritation seems not conducive to absorption from free mucous surfaces. This appears to be but an experimental confirmation of what is familiar in diarrheas. The more chronic irritation of distention for a number of hours lessens the vitality of the cells of a mucous membrane, perhaps loosens the cementing substance in which they lie, and so permits more ready passage through the membrane to the lymphatics in the muscularis below.

III. Resorption of Urinary Constituents.

Since the healthy bladder absorbs drugs that are injected into it, there next comes the question, How about the urinary constituents? The salts of urine are eminently diffusible. Do any of them find their way back into the blood through the bladder walls after their elimination by the kidneys. Bazy had injected a solution of urea into the bladder and found on withdrawing it a reduction in the quantity of liquid, though the urine must have been coming into the bladder all the time. Any one who has tried to empty a dog's bladder completely by catheterization knows how open to fallacy are any conclusions founded on the amount of fluid withdrawn. Ashdown injected a solution of urea containing a certain amount of salt into the bladder of dogs, tied the ureters, and after some time removed and tested the urea solution to find that the quantity had been lessened, and that some of the urea had disappeared. We thought that perhaps by varying the number of urinations in a day, so that on one day the urine secreted would not be retained in the bladder for more than one to one and a half hours; the next would be retained for six to seven hours, we might

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be able to demonstrate whether or not the resorption of urinary constituents took place through the bladder. We had begun our observations in this line, and were very much encouraged by their results, when, in talking the matter over with Professor Reichert, he mentioned that a series of experiments had been undertaken by Kaupp,[1] of Tübingen. He carefully compared the urine passed on a number of days when the bladder was emptied every hour, with that passed on the same number of days after being retained for twelve hours. His results showed him that the water was reduced in quantity as well as all the solid elements in the urine. The urea was reduced proportionately least of all. His experiments are scarcely known to-day, and so we thought that a confirmation of his results from a new set of observations, if it were possible, would be at once interesting and profitable; it would recall attention to a subject that is of some practical importance. Observations were made by two experimenters on two series of days. In one series the urine was passed from twelve to fifteen times per day (twenty-four hours),—that is, about every one and a quarter hours of the sixteen hours of the working-day. In the other series it was passed four times per day, at 8 A.M., 2 P.M., 7 P.M., and 12 P.M. The amount of exercise taken on the various days and the general round of occupation were very much the same. Alternate days were chosen for the observations in each series as furnishing a fairer basis of comparison. To be sure that no rhythm of urinary secretion due to special occupation or other circumstances might exert an influence, in alternate weeks the series began on different days. Where notable difference occurred, as on Sundays, Washington's Birthday, and March 9, on which an examination and the Faculty Tea were disturbing factors, such days were omitted from our tables.

For thirty days we arranged to take just the same amount of liquids. Before breakfast, six ounces of water; at breakfast, five ounces of coffee; before dinner, six ounces of water; at dinner, four ounces of soup; and A. took five ounces of tea, B. six ounces of milk. Before supper, six ounces of water; at supper A. took five ounces of tea, B. five ounces of coffee and four ounces of milk. At 11 P.M. lunch, always the same, and six ounces of water. Each two days that were to be compared, the food eaten was chosen, as far as possible, the same. There was not absolute similarity, though boarding-house diet is not very varied, and what differences did occur would equalize themselves in a series of thirty days. Where a radical difference in diet was used, as on Wednesdays and Fridays when meat was not taken, those days were compared with each other, leaving Thursdays and Saturdays for comparison.

[1] Vierordt's Archiv für physiolog. Heilkunde, 1856.

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The table of results is appended. The specific gravity was determined by the ordinary urinometer. It is not very exact in its absolute results, but for purposes of comparison, where a series of observations were made, its value can scarcely be impeached. The specific gravity was always taken with the urine at the temperature of a living room, —*i.e.*, about 65° F., the urinometer being calculated for urine of about 60°. The solids in the urine were obtained by Neubauer's factor, 2.33. The mean temperature and the relative humidity, 8 A.M. and 8 P.M., for the days on which observations were made, were taken from the files of the *Ledger*. They serve to show that whatever influence the temperature and humidity had on the secretion of urine, that influence has not by any chance been exerted in such a way as to make them a factor in the results that have been reached from the observations.

TABLE I.—*Experiments A.*

Date.	Am't of Urine.	Specific Gravity.	Solid Grms.	Mean Temp.	Relative Humidity at {8 A.M. and 8 P.M.	
February 18	1283	1024	70.46	37° F.	50–65	Frequent.
" 19	1146	1025	66.76	37° F.	78–61	Infrequent.
" 20	1311	1023	70.26	32° F.	64–65	Frequent.
" 21	1000	1027	62.91	38° F.	100–60	Infrequent.
" 25	1011	1026	61.25	36° F.	84–57	Infrequent.
" 26	1270	1024	69.75	30° F.	54–30	Frequent.
" 27	1195	1024	65.62	38° F.	57–47	Infrequent.
" 28	1334	1022	67.05	53° F.	90–65	Infrequent.
March 1	1150	1025	66.99	46° F.	93–82	Frequent.
" 2	1305	1023	69.93	34° F.	87–71	Frequent.
" 4	1206	1024	66.23	44° F.	72–66	Infrequent.
" 5	1360	1022	68.35	26° F.	57–52	Frequent.
" 6	1340	1022	67.35	38° F.	66–54	Infrequent. Constipation.
" 7	1386	1021	67.82	43° F.	93–100	Frequent.
" 8	1167	1027	73.45	46° F.	83–96	Infrequent. Constipation.
" 11	1345	1022	67.59	32° F.	81–84	Frequent.
" 12	1180	1025	67.74	33° F.	100–88	Infrequent.
" 13	1245	1026	75.42	41° F.	88–92	Frequent.
" 14	1127	1026	68.27	26° F.	100–100	Infrequent.
" 15	1273	1025	74.15	34° F.	63–40	Frequent.
" 16	1085	1026	65.73	30° F.	95–54	Infrequent.
" 18	1298	1023	69.56	38° F.	44–50	Frequent.
" 19	1325	1024	73.31	39° F.	42–38	Frequent.
" 20	1318	1023	70.63	34° F.	53–50	Frequent.
" 21	1322	1024	72.60	37° F.	45–40	Frequent.
" 22	1075	1025	62.61	35° F.	75–39	Infrequent.
" 23	1172	1025	68.28	42° F.	48–54	Infrequent.
" 25	1175	1025	68.44	46° F.	83–27	Infrequent.
" 26	1075	1027	67.65	44° F.	47–37	Infrequent.
" 27	1087	1025	63.32	38° F.	46–47	Infrequent.

Average amount of urine on frequent days . . . . . 1313 cc.
Average amount of urine on infrequent days . . . . . 1139 cc.
Average amount of solids on frequent days . . . . . 70.47 grms.
Average amount of solids on infrequent days . . . . . 66.40 grms.

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Average difference in amount of liquid . . . . . 174 cc.
Average difference in amount of solids . . . . . 4.07 grms.
Average mean daily temperature, frequent days . . . . . 38.14° F.
Average mean daily temperature, infrequent days . . . . 38.56° F.

The temperatures were very nearly the same, and were not a factor in the results obtained.

TABLE II.—*Experiments B.*

Date.	Am't of Urine.	Specific Gravity.	Solid Grms.	Mean Temp.	Relative Humidity at {8 A.M. and 8 P.M.	
February 18	1110	1030	72.00	37° F.	50–65	Frequent.
" 19	954	1031	68.91	37° F.	78–61	Infrequent.
" 20	1056	1029	71.35	32° F.	64–65	Frequent.
" 21	968	1029	67.41	38° F.	100–60	Infrequent.
" 25	970	1032	72.22	36° F.	84–57	Infrequent.
" 26	1127	1029	76.15	30° F.	54–30	Frequent.
" 27	1037	1028	67.65	38° F.	57–47	Infrequent.
" 28	940	1030	65.71	46° F.	93–82	Infreq. Diar. Four stools.
March 1	1067	1030	74.58	53° F.	90–65	Frequent. Three stools.
" 2	960	1030	71.00	34° F.	87–71	Frequent. Three stools.
" 4	1085	1029	73.43	44° F.	72–66	Frequent.
" 5	980	1029	66.22	26° F.	57–52	Infrequent.
" 6	1120	1028	73.07	38° F.	66–54	Frequent.
" 7	1092	1028	71.24	46° F.	83–96	Frequent.
" 8	1012	1027	63.71	43° F.	93–100	Infrequent.
" 11	980	1029	66.22	32° F.	81–84	Infrequent. Three stools.
" 12	992	1029	67.03	33° F.	100–88	Infrequent.
" 13	1114	1030	77.86	41° F.	88–92	Frequent.
" 14	1088	1028	70.98	26° F.	100–100	Infrequent.
" 15	1170	1028	76.33	34° F.	63–40	Frequent.
" 16	1210	1026	73.30	30° F.	95–54	Frequent.
" 18	1032	1028	67.33	38° F.	44–50	Infrequent.
" 19	1220	1025	71.07	39° F.	42–38	Frequent.
" 20	1008	1026	61.06	54° F.	53–50	Infrequent.
" 21	1340	1023	71.81	35° F.	75–39	Frequent.
" 22	1206	1024	66.23	37° F.	45–40	Infrequent.
" 23	1252	1025	72.93	42° F.	48–54	Frequent.
" 25	1080	1027	67.99	46° F.	83–27	Infrequent.
" 26	1191	1027	75.04	44° F.	47–37	Frequent.
" 27	1048	1028	68.37	38° F.	46–47	Infrequent.

Average amount of urine on frequent days . . . . . 1141 cc.
Average amount of urine on infrequent days . . . . . 1020 cc.
Average amount of solids on frequent days . . . . . 73.41 grms.
Average amount of solids on infrequent days . . . . . 67.14 grms.
Average difference in amount of liquid . . . . . 121 cc.
Average difference in amount of solids . . . . . 6.27 grms.
Average mean daily temperature, frequent days . . . . . 38.60° F.
Average mean daily temperature, infrequent days . . . . 36.53° F.

The relative humidity does not lend itself to an average so well as the temperature, the daily changes often being rapid and great; but a consultation of the tables shows no special peculiarity favoring the

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results obtained by the observations. According to the observations of both the experimenters, there is a notable difference in the average amount of liquids and solids passed on days when the bladder was emptied frequently, and when it was not. Experimenter A. finds liquids reduced 174 cubic centimetres, and solids 4.07 grammes. Experimenter B. finds liquids reduced 121 cubic centimetres, and solids 6.27 grammes.

There is not much consonance in the amounts of reduction in the two series of observations, and only the fact of reduction is clear. This want of agreement, however, is probably accounted for to a great extent by the habits of the individuals. A. is of rather constipated habit; B. is rather the opposite, and always has at least two stools each day. A. does not wear woollens; B. does, and that probably notably reduces the liquid that would find its way through the kidneys.

IV. Experiments on the Urethra.

Absorption from the urethra can be very readily demonstrated. A number of reported cases of toxic symptoms after the free use of cocaine in the canal place its absorptive power beyond a doubt. Experiments were made to test this absorptive power for comparison with the bladder.

Experiment XXVII.—Dog, weight 50 pounds, used in Experiment IV. Two-tenths of a grain of apomorphine hydrochlorate by the bladder failed to produce emesis. The same quantity dissolved in five drops of water and introduced into the anterior urethra with a medicine-dropper produced emesis in nine minutes. The instrument used was the ordinary blunt eye-dropper, so that there was no injury of the mucous membrane, and the drug reached only the first half-inch of the canal.

Experiment XXVIII.—Dog; 8 kilos. (same as in Experiment III, two weeks later). Two grammes of atropine sulphate introduced into the anterior urethra gave dilatation of the pupils after seven and a half minutes, while it had required twelve minutes for the same amount to cause dilatation from the bladder.

Experiments were then made to demonstrate the absorptive power of various parts of the canal. An instrument was devised to limit the fluid injected to a particular part of the canal. The end of a No. 5 flexible catheter having been cut off, the thin piece of wire as a stylet was run through it, and fastened in a perforated shot of about the size of the catheter. After introducing the instrument for a certain distance, the catheter was withdrawn for an inch, leaving a particular part of the canal between the shot and the end of the instrument to be filled with the injection. A sufficient amount of almond oil to just fill the catheter

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was injected into it after the drug, to be sure that all the drug got into the canal.

Experiments XXIX, XXX, and XXXI.—Apomorphine hydrochlorate. Two injections of apomorphine at different points between the meatus and the bulb gave results in about the same time as they did in the anterior urethra.

Beyond the bulb, in the membranous portion of the canal, absorption was delayed. As the pelvic portion of the canine urethra is longer than the human organ, we found no difficulty (or at least we thought so) in injecting our drugs well into the posterior urethra, and yet not into the bladder.

Experiment XXXII.—Dog; weight, 32 pounds. Two-tenths of a grain of apomorphine injected into the anterior urethra produced emesis in seven minutes.

Experiment XXXIII.—Three days later, two-tenths of a grain of apomorphine introduced into the posterior urethra about six inches from meatus, produced emesis only after twelve and one-half minutes.

Experiment XXXIV.—Dog; weight, 21 pounds. One-tenth grain of apomorphine in anterior urethra, emesis after ten and a half minutes.

Experiment XXXV.—Same dog, three days later. One-tenth grain of apomorphine in posterior urethra, emesis only slight after nineteen minutes.

Experiment XXXVI.—Dog; 13 kilos. Twenty-five grammes of atropine sulphate introduced into posterior urethra gave dilatation of the pupils, and failure to react to light after eleven minutes. A reference to Experiment XXVIII will show that a proportionate amount in the anterior urethra was considerably more rapid.

V. Experiments on the Vagina.

Absorption from the vagina is usually considered, I think, to be neither very rapid nor of much moment. As a distinguished professor of therapeutics puts it, "Gynecologists have at all times used such a variety of powerful drugs locally on the vagina, and without ill effects, that it probably absorbs little; and of most of the drugs, scarcely any." We did not find it so unabsorptive.

Experiment XL.—Bitch; 11 kilos. Had been used for blood-pressure experiments, and was to be killed. About a quarter-ounce of water, containing two grains of strychnine, was injected into the vagina. Part of the liquid was lost immediately, on account of her struggles. It was thought that not more than one grain remained. Five minutes after its introduction, Dr. Carter, who had been making the blood-pressure experiments, called attention to the rise in blood-pressure. About six minutes after the injection came the first convulsion, typi-

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cally strychnic in type, with marked opisthotonos, recurring at a slight shock or noise, and sending the blood-pressure far above normal; it had been considerably lowered by one and a half hours of chloroform anesthesia. The respirations ceased during the paroxysms, and were irregular between them. Twenty minutes after the injection they seemed to have ceased entirely. The animal did not die for twelve minutes more, however. The dose was, of course, an enormous one, but it was desired to kill the creature as soon as possible.

Experiment XLI.—Two-tenths of a grain of apomorphine hydrochlorate introduced into the vagina of a bitch, on a tampon through a glass tube, gave emesis after seven and a half minutes.

Experiment XLII.—Bitch; 14 kilos. One centigramme of strychnine hydrochlorate introduced into vagina on a tampon gave, after twelve minutes, some stiffness of legs; after twenty minutes, rather severe muscular twitchings. The tampon was forgotten, and allowed to remain. When the animal was being taken to the kennel upstairs, the movement causing the liquid to be squeezed from the cotton, the animal had a convulsion on the stairs.

Experiment XLIII.—Ten days later, one gramme of atropine introduced into the vagina gave dilatation of the pupil after seven and a half minutes, and dryness of the throat shown by swallowing efforts, in twelve minutes.

VI. Absorption by other Mucous Membranes.

For comparison with the bladder, the rapidity of absorption from other mucous membranes besides the vagina was studied.

Experiment XLIV.—Five minims of a solution containing one-tenth grain of apomorphine hydrochlorate were dropped on the nasal mucous membrane, and were followed by emesis in four and a half minutes.

Experiment XLV.—Five minims of same solution slowly dropped into the mouth of each of these dogs, three days later, gave emesis in between four and five minutes.

Experiment XLVI.—Five minims of same solution dropped into the nose of a second dog, gave emesis in five and a half minutes.

Experiment XLVII.—Two-tenths of a grain of apomorphine injected into the rectum of a bitch, gave emesis in eight minutes.

Experiment XLVIII.—Same amount into the rectum of a dog, gave emesis in nine minutes.

An attempt to drop a concentrated solution of atropine into the nose of a dog was followed by such vigorous protest after one drop had been instilled that it was given up. In the mouth, two drops of a

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solution of atropine sulphate, containing one grain of the salt, produced intense frothy salivation, that practically spoiled the experiment.

As, according to Professor Reichert's conclusions on apomorphine, the larger or smaller dose of the drug, where enough is given to cause emesis, does not advance or retard the effect, a comparison of the rapidity of absorption by the various avenues into the body seemed justified, though different amounts were used in the various experiments.

The orders of absorptive power would be then, from our experiments with apomorphine,—

(1) Venous injection.
(2) Subcutaneous injection.
(3) By the stomach.
(4) Nasal and buccal mucous membrane.
(5) Rectum.
(6) Vagina.
(7) Anterior urethra.
} Not much difference in rapidity of absorption according to our experiments.
(8) Posterior urethra.
(9) Bladder.

VII. Effects of Pressure on the Bladder and Urethra.

In attempting to reach the ureter, to study the absorption from it, we succeeded in reaching it in two cases only after the death of the dog. (From the anesthetic, of course.) Experiments were made immediately after death on these dogs to decide what pressure of water exerted through a canula tied into the ureter was necessary to force urine through the urethra,—that is, what distention of the bladder was necessary to produce incontinence from retention. In these two dogs, and in one other, the amount required was twenty-two, twenty-five, and twenty-six inches of water-pressure. In the bitch, but eighteen inches of water were required. In the living dog, with all reflexes abolished, by ether in the one experiment that we performed, between twenty-five and twenty-seven inches of water caused the passage of urine from the urethra.

As the orifice of the urethra is larger than that of the ureter, these amounts do not represent quite the amount of force necessary to cause the sphincter vesicæ (or venia anatomistorum), that ring of fibres at the bladder-neck that represents that structure, to give way and allow the passage of the urine. The absolute impossibility of forcing fluid into the other ureter, although nearly ten feet of water-pressure was applied, which threatened to burst the bladder, was demonstrated in each case by closure of the urethra; the ureter on the other side showed no signs of distention.

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VIII. Review.

Our experiments warrant the conclusion that the bladder does absorb; and we proceeded to see, if possible, why other experimenters had failed in a good many instances to find absorption.

Küss and Susini's experiments with the solution of ferrocyanide inside the bladder, and the iron salt on the outside, though quoted approvingly by physiologists, are absolutely of no value as regards absorption. To be absorbed, a substance need not find its way through all the coats to the peritoneal surface. Once through the vesical epithelium, it finds in the muscle the open lymphatic spaces ready to carry it into the system through the lymph-channels.

Absorption is eminently a vital quality; to kill the animal is to stop at once all the vital processes, especially the lymph movement which brings about absorption. Osmosis may still go on as through dead animal membranes; but this is very different from the vital force that causes absorption, though it has been often confounded with it.

The somewhat similar experiments of Cazeneuve and Livom with recently removed bladders, and the test for urea in the water in which they were placed, may be criticised in the same way. They were studying the difference in *imbibition* between the recently dead bladder walls kept in a state somewhat resembling the natural one by immersion in warm water, and the bladder walls rendered porous by rigor mortis, but not absorption from the bladder.

Bert and Jolyet and Alling found that on tying the urethra at the neck of the bladder they got no absorption from the bladder; and with very good reason. They had seriously disturbed or effectually tied off the lymphatics leading from the bladder; the paths by which any substance would find its way into the system from the bladder. Sappey, in his "Description et Iconographie des Vaisseaux lymphatiques," says, "In the dog and rabbit, the lymphatic trunks run from the summit of the bladder to the neck. Just at the level of the orifice of the urethra, they curve back to the right and left and go on to terminate in the glands situated below the external iliac vessels." A ligature at the neck of the bladder would almost surely include them, and so cut off all possibility of absorption.

As to the absorption taking place from the urethra, not the bladder. First, our experiments seem to show that the posterior urethra absorbs scarcely better than the bladder itself. Second, where proper-sized catheter is used, there is not likely to be any dribbling into the urethra during the experiment; and any that comes out after the catheter is withdrawn is immediately injected. Third, where the drug is well diluted, as it was in all of our experiments, and followed always by at

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least five cubic centimetres of water, to clear the drug from the catheter, not enough of the solution could possibly stay in the canal to produce the characteristic effect of the drugs, as noted in the experiments.

Finally, as to injury inflicted on the bladder walls by catheterization, where this is done carefully and gently it scarcely seems possible. The animals bear it without any manifestation of pain, they do not need to be tied, and one person can do the catheterization unassisted. For smaller animals it could be urged with more probability. But for good-sized dogs, it seems unreasonable to say that they are injured by every insertion of a catheter.

Susini's experiments directly on the bladder of dogs with KI have been shown to be conclusive by Ashdown, who demonstrated that, injected into the bladder, it was eliminated by the kidneys. As to the experiments with KI and belladonna on his own bladder, not enough of the drugs were employed to allow for the accumulation in the system necessary to give the symptoms of their intoxication.

The last series of direct experiments by direct injection of poisonous substances into the bladder, performed by Drs. J. Boyer and L. Guinard, seem to have been done with a great deal of care. The negative results obtained by them can only be attributed to the fact that they used doses which were not sufficiently large. To a dog of 16 kilos., they gave fifty centigrammes of cocaine. Now, a dose of .03 grain[1] per kilo. (that would be for a dog of this size, forty-eight centigrammes) has been known not to kill a dog when injected directly into a vein. It is not very surprising, then, if the much slower absorption of the same dose from the bladder should fail to give noticeable symptoms. Morphine has to be used in very large doses to affect dogs, and they used it in the very ordinary doses of ten centigrammes. Of pilocarpine, they used ten centigrammes for a dog of 16 kilos. and twenty centigrammes for one of 18 kilos. The toxic dose by the vein is given as four centigrammes per kilo. (that would be for dogs of the sizes given, sixty-four and seventy-two centigrammes respectively). The dose they used was very small, and any noticeable symptoms could scarcely be expected.

For atropine, dogs have an idiosyncrasy, and stand the drug very well; ten centigrammes for a dog of 19 kilos. was a very small dose. The toxic dose by the vein should be about eight times that amount. Veratrine was also used in too small doses; more than twice the amount per kilo. that they used has been known not to kill a dog when injected into a vein.

There remain the experiments with strychnine, five centigrammes

[1] For the toxic dose of the drugs, as we have given them, we are indebted to Professor Reichert.

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of strychnine even in the bladder ought to give serious symptoms, and ten centigrammes ought to be absolutely fatal. Our own experiments with much smaller doses gave us distinct symptoms. Most of Ashdown's experiments were done with strychnine, and he never failed to get results with much smaller doses. Bazy, in contradiction to whose experiments Boyer and Guinard undertook theirs, did several experiments with strychnine in public after the publication of their article,[1] so that there remains no reasonable doubt that it is absorbed from the bladder.

Absorption is a matter of lymphatics, not of epithelial cells. The various forms of cells lining different parts of the respiratory, digestive, and genito-urinary tracts play mainly a protective part for the lymphatic structures beneath. That in some places they have a heightened activity, and seemingly a selective action in absorption is true; but at no part do they absolutely prevent absorption. Even the cutaneous epithelium, with its horny epiderm, will allow the passage of a number of substances. Rapidity of absorption, then, depends on the richness of the lymphatic structures in a part, and not on the character of the mucous membrane covering it. The lymphatics in the bladder are not numerous, but they are easily demonstrable. Absorption should take place then, though not rapidly.

Absorption from the vagina is more rapid than from the bladder, and this is in accordance with the richness of its lymphatic supply. If we were to consider absorption as dependent on the character of the epithelium, the many-layered, stratified, transitional epithelium of the vagina, almost cutaneous in character, would seem to be capable of effectually preventing all absorption. The difference in character of the epithelium of the first inch, and the rest of the anterior urethra, has no effect on its absorptive power.

IX. Conclusions.

(1) The bladder absorbs somewhat slowly the drugs that are injected into it, but it has a true absorptive power.

(2) The urinary constituents, water and solids, are, to a certain extent, reabsorbed from the bladder, when allowed to remain in it for some time.

(3) The anterior urethra absorbs more readily and rapidly than the bladder. The posterior urethra, about as the bladder does.

(4) The vagina absorbs very readily ordinary drugs that are injected into it.

[1] Comptes Rendus de la Société de Biologie, July 28, 1894.

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SOME NEW CONJUNCTIVAL MICRO-ORGANISMS.

By Joseph McFarland, M.D.,

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In the winter of 1892 and 1893 I was invited by Drs. William F. Norris and Charles A. Oliver to make an experimental study of the bacteria found upon the normal and diseased conjunctiva, with the view of incorporating the results of the researches in the chapter in their "System of Diseases of the Eye," to be written conjointly by Dr. S. S. Kneass and myself, "Upon the Micro-Organisms of the Conjunctiva and Lachrymal Sac."

Although the research lasted for a considerable length of time, its results were rather less gratifying than I had hoped, for most of the organisms found were those already described by others and of common occurrence in the air. On this account the chapter for which it was originally planned as a foundation was altered so as to become a systematic treatise upon all the bacteria which have from time to time been found upon the conjunctiva, given in alphabetical order.

The bacteriological examinations which I made had, however, brought to light a certain few organisms which seem not yet to have been favored with description. These were studied very carefully, but all proved themselves, so far as our experiments went, to be non-pathogenic.

The chapter in which they appear will in all probability not meet the eyes of many pathologists or bacteriologists, so I have obtained permission from the editors of the "System" to publish the following descriptions of the species which seem to be new, some time in advance of the book itself.

Bacillus Hirsutus n. sp.—This bacillus was obtained from a normal conjunctiva. It is a large bacillus measuring $1.75 \times 3.5\,\mu$, with rounded ends, tending to form long threads. At first glance the organisms do not appear to be motile, but when one is carefully examined for a time it not infrequently swims slowly and steadily away, although previously quiescent for some time. It seems more the habit of the organism to be quiet or sluggish than to be active. Not only are single organisms motile, but chains of three, four or more often swim quite well, without much sinuous movement.

Fresh cultures in gelatin or agar-agar generally show long threads whose individuals contain no spores. Old cultures, particularly on agar-agar, exhibit large numbers of large oval spores situated in the centre of the bacilli, whose diameter they do not increase.

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The bacillus grows well when cultivated; is a fine organism for experimentation, because of its large size and pronounced characters. It bears a distinct resemblance to anthrax.

FIG. 1.

On gelatin plates the colonies appear in eighteen hours as small spherical masses of laminated appearance, having tangent-like threads projecting in all directions. In twenty-four hours their size is doubled, and their appearance bristling. About this time some of the superficial colonies begin to extend over the surface of the gelatin in irregular masses not unlike the proteus, except that there is no movement of the colonies. In thirty-six hours liquefaction begins, causing the colony to appear as a floating island with innumerable, perfectly straight, long radiating filaments, extending from the centre to a considerable distance upon the solid gelatin. The appearance suggested is that of a sun radiating rays of light in all directions. At this time beautiful adhesion preparations can be made. After forty-eight hours liquefaction is rapid and the colony becomes broken up. (Fig. 1.)

The growth in gelatin punctures, while somewhat resembling anthrax, is quite characteristic. In six hours, in an ordinarily heated room, the growth can be observed upon the surface of the gelatin as a delicate colorless film. Beneath this the gelatin begins to liquefy with considerable rapidity, so that a funnel is formed. At the apex of the funnel the growth in the puncture begins to show radiating bristles or spiny processes, which may be short, or at times so long as to reach to the sides of the tube. The bristles are generally somewhat branched. These bristles extend along the entire length of the puncture. In three days the gelatin is liquefied about half-way down the puncture, the surface being covered by a distinct mycoderma. Flocculi float in the liquid and collect at the apex of the funnel. The mycoderma as soon as formed begins to contract and detach itself from the sides of the tube, so that before it is twenty-four hours old it begins to sink below the surface of the liquid. It scarcely leaves the surface before the formation of a second mycoderma begins, which, as it becomes well developed, also contracts, detaches, and sinks. Four times this is repeated, or if there be much gelatin in the tube, perhaps six times before the gelatin is all liquefied, the nutrient exhausted, and the growth ceases. In old cultures of two weeks' growth the gelatin is all liquefied, and the mycodermata and remaining irregular fragments of the coarse spines form an irregular flocculent mass at the bottom of the tube.

Upon the surface of the agar-agar the growth is rapid at the room

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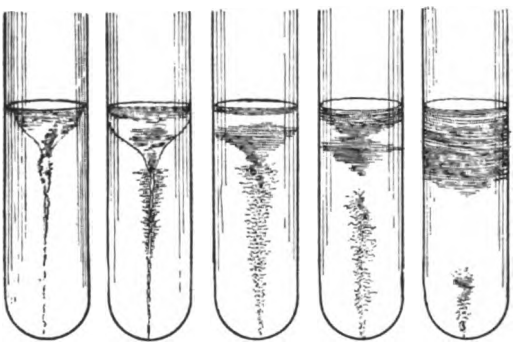
temperature, more rapid at 37° C., and is quite characteristic. It occurs along the whole length of the stroke, spreads laterally for some distance, and forms a thin pellicle with a long longitudinal wrinkle and innumerable delicate transverse wrinkles. The growth is whitish, translucent, and imparts a yellowish tinge to the agar-agar when old. From the edges of this pellicle multitudes of microscopic tongue-like projections extend upon the agar-agar, giving the growth the appearance of a surrounding halo. When distilled water is poured into the tube the whole growth begins to roll up, detaches itself entire from the agar-agar, and leaves its surface clean and smooth. The water of condensation which accumulates at the bottom of the agar-agar tubes is always covered by a pellicle of the growth, more dense, but otherwise similar to the mycodermata growing upon the surface of the gelatin.

FIG. 2.



24 hours. 48 hours. 3 days. 6 days. 2 weeks.

Bacillus Hirsutus.

The bacillus grows well upon potato, a broad, elevated, colorless band forming in forty-eight hours. To the naked eye this has a dull, translucent appearance. If it be examined by the microscope, the whole growth will be observed to be covered with innumerable projecting villi, somewhat like intestinal villi, smooth, but rather dull in appearance. The villi are more numerous and larger at the edge of the growth than in the centre, and appear to the naked eye as whitish dots, to the lens as warty masses. Later, when the culture begins to dry up, the villi transform themselves into ivory-like points and give the culture the appearance of being sprinkled with fine white powder.

In bouillon the growth is rapid. The liquid becomes turbid, and one after another the same mycodermata form upon the surface, detach, and sink to the bottom.

Litmus milk is decolorized in twenty-four to forty-eight hours.

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Coagulation without acid production takes place in three days. Afterwards the coagulum is digested and a clear, colorless whey remains. Cultures made in peptone solution containing rosalic acid also failed to show an acid reaction. The growth upon these media resembled that in bouillon and gelatin.

The addition of sulphuric acid and potassium nitrite to peptone-solution cultures gave a faint pink color, so that it seems probable that the organism produces indol in its growth.

Blood serum is rapidly liquefied, no peculiar characters being shown. Tests to determine the production of fermentation failed to show this activity. Injections into mice, rabbits, and guinea-pigs were without the production of any pathogenic symptoms.

The bacillus stains readily by the ordinary methods and retains the color well when stained by Gram's method.

Bacillus Coerulefaciens n. sp.—This organism was discovered once in the conjunctival secretion of a case of granular conjunctivitis. It is a minute bacillus, measuring 1.50 to 1.75 μ in length, and, being very slender, often slightly curved, so that the shape suggested that of the tubercle bacillus. It does not form filaments, the individuals being constantly isolated and always having rounded ends. In the hanging drop the bacilli appeared highly motile. No spores could be detected.

The organism stains well with the ordinary dyes and also by Gram's method. When cultivated upon gelatin plates the colonies appear in twenty-four to forty-eight hours as small, circumscribed, round, slightly granular points, which increase but little in size during the next twenty-four hours. They have a yellowish color and, possibly because of the evaporation of the slowly liquefied gelatin, are situated below its surface.

The growth of the organism upon gelatin (puncture cultures) was somewhat irregular. One series of tubes showed no liquefaction of the medium, but a yellowish surface growth and a moderate growth in the puncture, from the upper part of which a few fine filaments were seen radiating into the normal gelatin. Another series of gelatin tubes showed a small amount of very slowly liquefied gelatin just below the surface growth. A third series, made of tubes of gelatin containing a small amount of glucose, attained a more considerable size without liquefaction, and had a paler color than on the normal gelatin.

On agar-agar, a delicate, slightly yellowish, translucent band, devoid of any differential characters, is formed.

The growth on potato is highly characteristic and beautiful. In the course of twenty-four hours, a smooth, shiny, lemon-yellow, ele-

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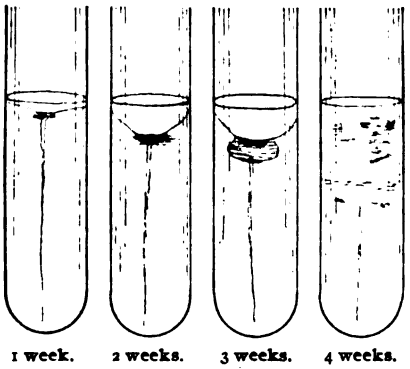
vated growth occurs along the line of inoculation. This continues to increase in size rather slowly until about forty-eight hours have passed, when a distinct blue color begins to extend throughout the part of the potato near the growth. The picture of the yellow growth upon the brilliant blue potato is a beautiful and characteristic one. By the end of a week the blue gives place to a lead color and the yellow growth becomes dirty green.

If the inoculated potatoes are placed in the incubator, the yellow growth becomes more luxuriant, but is never followed by a blue discoloration of the potato.

In bouillon and peptone solution no other change in the medium than a diffuse cloudiness can be determined.

In milk to which litmus is added a steady strong alkali production goes on, deepening the blue color almost to ultramarine. By the

FIG. 3.



Bacillus Coerulefaciens.

second week a yellowish ring begins to form near the surface. This latter develops into a brick-red color, like that of the bacillus lactus erythrogenes of Hüppe.

In a number of respects the bacillus resembles the organism just mentioned, yet the number and character of the differences seem to justify its description as a new species,—or at least a new variety.

Bacillus Circumscriptus n. sp.—This is a short oval bacillus, measuring 1 to 1.5 μ in length and from 0.5 to 0.8 μ in breadth, with round ends. It seldom forms chains of as many as ten individuals, and does not seem to form spores. It is a very delicate grower, and was only cultivated through a few generations before it died out. It was found but once.

It stains well both by the ordinary methods and by Gram's method.

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Upon gelatin plates the colonies appear in twenty-four hours. By the end of forty-eight hours they are slightly granular, orange-yellow, sharply circumscribed, slightly elevated masses, which are soon surrounded by a slight depression which becomes larger as the gelatin slowly liquefies and evaporates. The colonies always remain small.

In gelatin punctures the growth does not attain any characters until several days have passed. About the fourth day a dimple is visible where the platinum wire ended, and at its bottom a yellow speck can be observed. This increases in size slowly and becomes a kind of surface growth, occupying a cup from which liquefied gelatin has evaporated. In about two weeks liquefaction proceeds much more rapidly than evaporation, and the growth floats upon the surface of the liquid. In three weeks the liquefaction, which remains cup-like, reaches the sides of the tube, but spreads downward slowly, so that the liquefaction is not complete for six to eight weeks, after which flocculi form in the liquid.

The growth on agar-agar is circumscribed, forming a rather narrow band along the line of inoculation. It is of an orange-yellow color, transparent, and spreads at the sides by a series of rounded processes somewhat resembling the teeth of a dulled saw. It never spreads over the surface and avoids the expressed water at the bottom of the tube.

When touched with the platinum wire the growth is very friable, though the fragments cling together sufficiently to slide about upon the smooth surface of the agar-agar as if in no way attached to it. The agar-agar does not become colored.

No growth could ever be produced upon potato, either at room temperature or in the incubator.

In litmus milk a slight increase in the intensity of the blue color suggested the production of alkalies.

In bouillon the growth is rapid and causes a turbidity with a gelatino-flocculent precipitate.

Bacillus Succinacius n. sp.—This small bacillus measures from 1 to 1.75 μ in length and from .3 to .5 μ in breadth. It was found but once in a case of trachoma. The organisms generally are single or united in pairs, and have rounded ends. In moderately old cultures a large number of club and falciform individuals, probably involution forms, occur.

The bacillus takes the usual stains rather reluctantly, seemingly because of the rapid degeneration of its protoplasm. It does not stain by Gram's method.

Upon gelatin plates the colonies are slow in developing, not appearing until twenty-four to forty-eight hours. They are small, sharply circumscribed, spherical or round, yellow, translucent, and slightly

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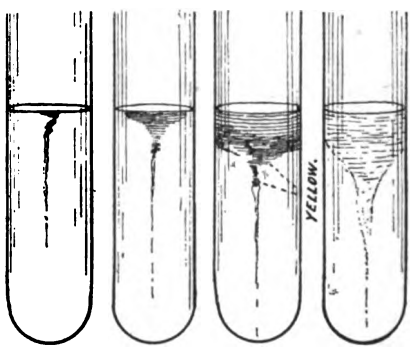
granular. The granular appearance is most conspicuous at the centre, where the effect is similar to a sprinkling of powdered glass upon the colony. This effect is more pronounced as the colony matures.

In gelatin puncture cultures a minute depression may be seen in eighteen hours. This increases in size, forming a cup below which a line of delicate yellow spherical colonies grow in the track of the wire. By the third day a delicate funnel of slightly clouded liquefied gelatin is seen extending from the air-bubble or cup to a considerable depth, terminating in a long sharp apex. This growth in the liquid is surmounted by a yellow flake, representing a surface growth which occupied the floor of the cup previously mentioned. The growth spreads, until after four weeks the entire gelatin is liquefied.

The growth on agar-agar is very delicate, consisting of a narrow transparent amber band of very slight thickness. It presents the same

FIG. 4.



2 days. 3 days. 4 days. 6 days.

Bacillus Succinacius.

appearance throughout the entire length, and is not modified by the moist condition of the agar-agar at the lower part of the tube. It appears a little thickened at the rounded edges, when viewed through a lens, than in the middle. When touched by the platinum wire it is very brittle and non-adhesive, so as to be taken up by the wire with difficulty. The growth was best at room temperature, reached its maximum development in about six days, and did not change in appearance subsequently. The agar-agar was never discolored by the growth.

Although numerous attempts were made, it always seemed impossible to secure a growth upon potato.

In bouillon, small zooglea formed at the bottom of the tube, the clear character of the medium being unchanged. The growth is always scant.

Litmus milk is discolored without acid production. Late in its

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development the bacillus causes the milk to be covered by a yellow pellicle.

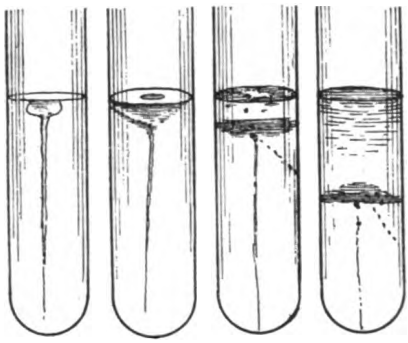
Bacillus Violaceus Flavus n. sp.—Like the preceding, this organism was cultivated from the eye of a case of trachoma, and was met but once.

It is a short oval individual, with rounded ends, resembling the short forms of the typhoid bacillus, but a little smaller. In the hanging drop it is found to be actively motile and to form chains of from two to eight individuals, which are also motile, swimming with a sinuous movement. No spore formation could be detected.

The organism stains well with the ordinary dyes, but does not stain by Gram's method.

The colonies upon gelatin appear in twenty-four hours as irregular yellowish-white clumps of granular character. They are rather cir-

FIG. 5.



3 days. 4 days. 6 days. 14 days.

Bacillus Violaceous Flavus.

cumscribed at first, but, as liquefaction progresses rather rapidly, are soon surrounded by a little zone of liquid, bridged over in many places by bristling fibres extending from the colony to the normal gelatin beyond the liquid zone. These little bristles are too small to receive the name processes, but sometimes give the colony a radiated appearance.

In gelatin the development of puncture cultures is rapid, a little cup of liquefaction being observed in forty-eight hours. This increases in diameter more rapidly than in depth and reaches the sides of the tube in four to five days. At the apex of the cup the growth accumulates and appears as a pinkish, though sometimes as a yellowish, mass. The liquefied gelatin has a delicate violet hue. Complete liquefaction of the gelatin does not take place for about a month, after which the upper fourth of the liquid has a pink color and is surrounded by a delicate incomplete pink or violet mycoderma.

Upon agar-agar the growth attains its most marked characteristics.

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Along the line of inoculation a rather delicate band of pink, smooth and glazed below, knobulated above with distinctly circumscribed borders, forms. This does not attain any considerable size before the agar-agar itself becomes a beautiful transparent violet, most marked at the upper part of the tube. The growth which occurs in the expressed water collects in the form of sediment at its bottom, and curiously enough has a distinct *yellow* color. Frequent transplantations to new, especially fresh, agar-agar causes the violet color to be intensified. As the cultures increase in age the colors fade and become yellowish white.

The peculiarity of two colors, yellow and pink, at once suggested a mixed culture. Every precaution was taken to avoid such an error, the culture was frequently on plates, the yellow growths and the pink carefully examined, but only one bacillus, always the same, and only one colony, could be found.

On potato the growth is rather luxuriant and of a dirty salmon color. Bouillon, in which the growth is rapid, soon assumes a violet hue and is covered by a thin pinkish or violet mycoderma. The part of the growth which sinks to the bottom of the tube is always yellow. It would seem that the bacillus produced two pigments, one pink or violet, formed only in the presence of plenty of oxygen, and one yellow, produced in the absence of oxygen.

A slight acid production was also observed.

SUCCESSFUL COLOTOMY.

By Beriah Edwin Mossman, M.D.,

Greenville, Pa.

The following case is deemed sufficiently interesting to warrant its publication:

J. E. S., aged 37 years, has complained of the symptoms of cancer of the rectum for two years.

He had an operation on the rectum in the summer of 1893, in November, 1893, and again in March, 1894. The operation performed in March was quite extensive, and necessitated the removal of about four inches of the rectum, which was cut off with the cancerous mass. The bladder was involved. The gut was not brought down and secured externally, but left loose in the track of the wound.

The growth of the cancer after this was rapid, and by extension closed up the outlet of the bowel. Chromic acid was used on a swab

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to burn away the growth, to permit of the passage of fecal matter. At first the chromic acid was used occasionally only, but after a time it had to be used quite frequently. The suffering was considerable. At last the acid failed to maintain an opening, and the patient's condition was very precarious.

The cancer filled the entire lower part of the pelvic cavity. Examination showed that it extended high up in the pelvis also. The anus was a mere opening through a solid cancerous mass; there was no sphincter and no rectum. This opening had been maintained for one year by a plug, kept in with a tight perineal bandage. It was decided to perform left inguinal colotomy. On May 8, I made an incision four and a half inches long in front of the anterior superior spinous process of the ileum and nearly in the direction of the muscular fibres of the obliquus externus muscle, but extending more towards the centre of the abdomen. The artificial anus was made just one inch above the highest point of the crest of the ileum and two inches from the anterior superior spinous process.

The operation was after that of Littre as improved by Maydl. The colon was brought up and a pencil wrapped in iodoform gauze was passed through under it. Two stitches were put into the wound above the colon, the first one of silkworm gut, and the second, next to the colon, of catgut; one catgut stitch was placed in the lower end of the wound below the colon. The colon was stitched down through its lumen with catgut close to the pencil on both sides, and two additional stitches were passed through the lumen along the wound on both sides, both above and below the pencil. The pencil formed a bridge over which the colon passed. The colon was brought out above the sigmoid flexure. When the work was done the amount of the colon on the outside seemed quite large. The wound and colon were dressed with iodoform powder, layers of iodoform gauze, sublimated gauze, and absorbent cotton. At no time did the temperature go above $100\frac{7}{8}°$ F. On the fifth day the second stage of operation was done: an incision was made transversely through the gut and the bowel injected with a solution of inspissated ox gall, and the bowels freely moved. Every other day this cut was extended until the ninth day, when the gut was cut through down to the pencil.

The patient made a very rapid recovery, and at the end of three weeks was able to go out and hoe in the garden. The bowels were kept open for the first two weeks by injecting a solution of ox gall, but part of the time they acted nicely without any injection. The operation in front was selected in preference to the lumbar region solely on account of convenience in attending to the bowel when a motion would take place, the opening of the peritoneum not being

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considered a matter of sufficient importance to influence me against a decision in favor of the abdominal operation. Nothing could be more successful than the result of this operation, and had it been performed a year earlier the patient's life would have been more comfortable, and, beyond doubt, considerably prolonged, as the continued burning with acid aggravated the disease and helped to increase its growth and to break down the constitution of the patient, which at the time of the operation was much depressed.

The lower portion of the detached bowel is kept open above and below, as the amount of discharge from the cancer is quite abundant and requires a considerable amount of attention in order to keep it clean and disinfected.

But little inconvenience is experienced in attending to the bowels when a motion takes place. It seems to me that inguinal colotomy should be performed in place of the lumbar operation in all cases, excepting those in which the conditions are such that it is not possible to work in the inguinal region.

MEMORANDUM.

NOTES ON AMERICAN LEPROSY.

Leprosy in Colombia.

The fact that there are 24,000 to 30,000 lepers in Colombia—that is, as many lepers as there are in the rest of South America, the Sandwich Islands, North America, and Europe together—should give that country a pre-eminent importance in the eyes of leprologists. There is no proof that the disease existed in Colombia before the invasion. Why should it prosper there and not in Peru? The only essential difference between the two countries seems to be one of climate. But there is one circumstance which might throw some light on this singular difference. Colombia, New Granada, Venezuela, etc., are countries where insect life is extremely abundant, and very probably pestilential, carrying poisons to the human organism with which they come into contact.

Cases of leprosy are more numerous in the river valleys, where the air is loaded with moisture, and becomes an enormous stimulant to the production and development of insect life. Such valleys are more frequently found and more densely populated in Colombia than in Peru.

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re occupied by a low class mixed race of Spaniards, negroes, and Indians. The better class, the agricultural part of the nation, occupy the templados, 6000 to 8000 feet above the sea-level; the wealthiest part live still higher up above the templados, on the pomuros. The disease develops in climates which vary 14° to 20°, generally humid, and very sparely lashed by winds.

An Extremely Interesting Particularity about Leprosy in Costa Rica.

Dr. Emilio Echeverria, of San José, writes me that all cases of leprosy in that country, which came to his knowledge, were of the anesthetic variety, with one exception, that of an old negro, who brought the disease from his native Jamaica; he had lepra tuberosa. He adds that, to his knowledge, there is no physician in Costa Rica who has seen original tubercular leprosy in that republic. Dr. Echeverria adds that he is pretty sure that this case of tuberosa was the only tubercular case ever observed in Costa Rica.

This anesthetic leprosy, considered by Dr. Echeverria as post-Columbian, is gaining ground rapidly in that part of the world, although it would be too much, so far, to call it widespread.

History of Leprosy in Cuba.

Dr. D. Enrique Robelin writes: "In all America leprosy has been imported; the Indians never knew this scourge until the first conquerors reached its shores. We may extend this assertion to all the Antilles, including Cuba. Not having existed *ab ovo*, we cannot well assert that leprosy has always existed in Cuba.

"The disease begins to be known at the time of the colonization, which proves that lepra is inherent to men, and that it always follows human currents.

"Are there statistics on which we can found the relations between the number of lepers existing in the divers epochs up to our own days? Unfortunately they do not exist: nothing has been done in Cuba to obtain such information. The director of the leper hospital of Havana could not give me these statistics. And if for one asylum there are no data, what can we expect from the province of Havana and the whole island? In a country eminently leprous like ours, in which the two leper races, Africans and Asiatics, are largely represented, this negligence is incomprehensible. It is more than probable that in Cuba leprosy has spread as it has in other countries. To-day, even in our own capital, the lepers are numerous. We speak of those we see; and those who hide, how many are they?"

Albert S. Ashmead, M.D.

New York.

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EDITORIAL.

BLADDER-ABSORPTION.

THE question of absorption from the bladder, curiously enough, has been but rarely discussed by practical physicians, and has received but limited attention by physiologists. Renewed interest was awakened in the subject in 1893 by Bazy in a communication presented to the Academy of Medicine of Paris. He stated that, contrary to the almost unanimous agreement of physiologists that the vesical mucosa did not absorb, he had found that it did, and almost as readily as cellular tissue. A review of the literature shows that the experimenters are not in accord in their conclusions, and that the matter may therefore be said to be in dispute.

In this number of the MAGAZINE will be found the results of a recent study of the subject that seem to be conclusive. The writer, after a large number of experiments upon dogs and rabbits, which were performed with the utmost care, in order to avoid any possibility of fallacy, has been able to observe the physiological action of drugs introduced into the bladder, without exception, if the quantity injected was sufficient in amount.

In practice, the dose by the mouth is considered to be twice that which would be given by the vein, and the rectal dose three times the amount. The writer concluded, therefore, that it would be fair to assume that, inasmuch as the bladder was not intended by nature to possess any special absorptive function, four times the dose by the vein would be required to produce the physiologic action of the drug, and in this dose the effects were invariably noticed. The drugs that were employed in these experiments were atropin, strychnin, apomorphin, chloroform and ether, and potassium iodide. It is true this is not a large list, but it is sufficient to at least decide the question of the absorptive power of the bladder. It would scarcely be contended that the bladder-wall possessed a selective power by which certain drugs would be absorbed while others would not.

The question of the resorption of urinary constituents is also taken up. It was found by the observations of two independent individuals that both the fluid and the solid portions of the urine were absorbed to some extent.

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The observations were carried out as follows: On each alternate day the urine was passed about every hour and a quarter (twelve to fifteen times in the sixteen working hours). These were called "frequent" days. The other days the urine was passed but four times,—8 A.M., 2, 7, and 12 P.M. These were the "infrequent" days. Exactly the same amount of fluid was taken each day.

As far as possible the habits of each were the same on each successive day throughout the experiment. The mean temperature and the relative humidity were also taken into account. As a result, A. found that the average quantity of urine passed on frequent days was 174 cubic centimeters in excess of that on infrequent days, while the average amount of solids was 4.07 grams in excess on the frequent days. B. found that on the frequent days the average volume of urine was 121 cubic centimeters in excess of the average on infrequent days, while on the former, the solids averaged 6.27 grams more than on the latter. The temperature and humidity were so constant as not to enter as factors in the consideration. Each observer clearly demonstrated the fact of a reduction, both in the fluid and solid constituents, on the infrequent days, and the want of consonance between the two may be accounted for, possibly, to a great extent, by the differences in the habits of the two individuals.

The question of absorption from the urethra was also taken up, and there was no difficulty in demonstrating, as in the case of the bladder, a true absorptive power. A practical illustration of this is seen in the cases in which toxic symptoms have followed the injection of cocain into the urethra. It was observed that the anterior urethra absorbed more readily than the posterior.

Experiments made on other mucosæ showed the same absorptive power in greater or less degree.

The impossibility of forcing fluid from the bladder into the ureter was shown by an experiment in which, after occluding the vesical neck, nearly ten feet of water-pressure were applied by inserting a canula in one ureter. This force was so great that the bladder threatened to rupture, but there was no sign of the appearance of fluid in the other ureter. In other experiments, from twenty-five to twenty-seven inches of water-pressure were sufficient to overcome the resistance of the vesical sphincter in the fully etherized dog. A review is given of the work of other investigators, and the lack of harmony in their results is explained by certain apparent fallacies in the methods of some of the observers. The author points out that absorption is a matter of lymphatics, not of epithelial cells, and, although the lymphatics of the bladder are not numerous, they are easily demonstrable.

This work should have an immense clinical importance. The

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observations are of interest, not only to the surgeon, but to the physician as well. They explain, in genito-urinary surgery at least, the unfavorable results that frequently follow operations upon the urinary tract, and they point to a physiologic reason for the exercise of the most scrupulous cleanliness in all procedures involving these organs. They also emphasize the value of the permanent catheter after operations on the bladder or urethra, which is so strongly advised by Guyon, and of the usefulness of frequent irrigations in diseased condition of these organs. It has been shown that in health the urine is free from germs, but there are so many conditions that cause a departure from this state that such a possibility should be kept constantly in mind.

THE EFFORT TO REVIVE THE "INDEX MEDICUS."

ALTHOUGH the publisher of the *Index Medicus* announced several months since that, unless it received a more liberal support, he would be obliged to discontinue it, this appeal did not secure sufficient interest and encouragement, and the publication ceased. The great loss sustained by the profession has been keenly felt already, and there is now manifest a very active movement to revive the *Index*. A number of physicians have already expressed their willingness to increase their subscription to $25 yearly. It is only necessary to secure 200 subscribers at this rate to guarantee the continuation of this valuable work. The *British Medical Journal*, the London *Lancet*, numerous medical journals in this country, and a great many physicians have testified to the inestimable value of the work, and have expressed a sincere desire to have it continued. If this is to be accomplished there should be a united action at once. There should be no difficulty in securing the necessary support. The *Index* is so important to all engaged in the study of the progress of medical science, that it should not be allowed to drop, and there are certainly physicians enough in this country who will contribute their share towards its continuation if the matter is properly brought before them.

It is proposed, when 200 subscriptions have been received, to close the list and begin the work. Only 202 copies will be printed; there will be no exchanges. Subscriptions may be sent either to Dr. John S. Billings or to Dr. Robert Fletcher.

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MEDICAL PROGRESS.

MEDICINE.

UNDER THE CHARGE OF

WILLIAM PEPPER, M.D., LL.D., AND JAMES TYSON, M.D.,

ASSISTED BY

M. HOWARD FUSSELL, M.D.

THE PROGNOSIS AND DIAGNOSIS OF DIPHTHERIA.

BERNHARD (*Arch. für Kinderheilkunde*, Vol. XIX, Parts 1 and 2, 1895) directs attention to the futility of making the prognosis in a case of diphtheria upon the presence or absence in the urine of albumen, which, when present, may be due not only to nephritis, but also to fever, changes in the blood-pressure, or complicating diseases, and remarks how frequently in the beginning of even very severe cases albumen may be absent or present in very small quantities, while in mild cases it may be present in considerable quantities from the commencement. Not so the urine sediment, which in many cases of diphtheria is quite diagnostic of the disease. It then consists of swollen, cloudy, markedly fatty, degenerated, crumbling, renal epithelium, narrow hyaline and granular tube casts, free fat globules, leucocytes, occasional erythrocytes, and frequently considerable quantities of uric acid and urates. The severity of an attack of diphtheria depends upon both the susceptibility of the patient and the virulence of the bacteria, and the prognosis is to be made accordingly. The examination of the urine sediment, revealing, as it does, slight or marked damage to the kidneys, permits of an inference as to the resistance offered by the other organs of the body, and is thus the best factor upon which to base an opinion regarding the severity of an individual case of diphtheria. If the urine sediment in the beginning of the disease contains the above-mentioned characteristic morphotic elements, the prognosis is unfavorable; death will occur, or in more favorable cases, after long illness with severe cardiac and nervous symptoms, the patient may recover. The occurrence of this sediment in the second week allows of a more favorable prognosis, but even then often enough paralyses and death ensue. The early occurrence of this sediment is an indication of the administration of large doses of the antitoxin, even when the pharyngeal symptoms are very mild.

A DUBIOUS CASE OF SPONTANEOUS RUPTURE OF THE SPLEEN.

STENDEL (*Münchener medicinische Wochenschrift*, No. 5, January 29, 1895) reports the case of an officer who, excepting mild attacks of malaria and dysentery, had always been well until, following a severe bodily exertion, he was seized with the following symptoms: Frequent painful breathing of costal type, without demonstrable lesions of the lungs, persistent singultus, pain in the lower part of

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the chest and upper part of the abdomen, always most intense in the splenic area, later localized there, a palpable tumor in the region of the spleen, moderate elevation of the bodily temperature, later symptoms of slight pleuritic irritation. A rather rapid recovery ensued. Differential diagnosis between rupture of the diaphragm and rupture of the spleen is attempted, and while the latter cannot be proved, the possibility of its existence cannot be denied.

Serum Therapy in Typhoid Fever.

Peiper (*Centralblatt für innere Medicin*, No. 21, 1895), at the "Dreizehnte Kongress für innere Medicin," Munich, 1895, reported the results of his investigations regarding the immunizing property of serum from sheep, which during the course of three months had been treated with large doses of sterile typhoid bacilli cultures. By simultaneous injection of this serum and virulent cultures of the bacilli, guinea-pigs and mice were protected from three times the ordinarily fatal dose. The serum administered to very sick animals, three or four hours after the fatal dose of the virulent bacilli had been given, was even capable of restoring them to health.

Klemperer and Levy (*Berliner klinische Wochenschrift*, No. 28, 1895), investigating, came to the conclusion that their serum from dogs was capable of rendering animals immune to the typhoid bacilli, and where administered some time after infection had occurred served to cure the animals. They administered the serum to five human patients, all of whom were in the first week of their illness. They all received three injections of twenty cubic centimetres each, on each of three successive days. There occurred no noteworthy change in the course of the disease, the cases progressing as mild. They conclude that the serum is without any dangerous properties, and that it does not stop the course of the disease. It may accelerate the acquisition of immunity which is acquired in each case, but they are unable to say that the mildness of the attack was due to any action of the serum.

Jaksch (*Centralblatt für innere Medicin*, No. 21, 1895), at the "Dreizehnte Kongress für innere Medicin," Munich, 1895, reported a series of investigations regarding the action on typhoid-fever patients of serum taken from patients convalescing from typhoid fever. The injection caused slight pain, but no inflammation nor abscess formation. While it produced no deleterious effects, it did not in any way favorably influence the course of the disease. All patients treated in this manner recovered.

Acromegaly and Trauma.

Unverricht (*Münchener medicinische Wochenschrift*, Nos. 14 and 14a, 1895) reports the case of a man, aged 31 years, who, following an accident, became afflicted with various nervous and muscular symptoms which were of such a character as to cause the case to have been diagnosed by able men as one of traumatic neurosis. Minute inquiry into the history of the case, and a careful examination of the patient revealed, in addition to the above-mentioned nervous and muscular symptoms, the characteristic enlargement of the hands and feet and of the bones of the skull, with the consequent change of physiognomy, which latter became very evident upon comparison of a photograph of the man in his present condition with one taken some years previously. Particular attention is directed to the

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bitemporal hemianopsia, thought to be due to an hypertrophy of the hypophysis cerebri, which in turn is supposed by some to play an important *rôle* in the production of the disease. He lays particular stress upon the importance of being careful in the diagnosis of traumatic neurosis; and, discussing the theories regarding the production of acromegaly, remarks that none entirely satisfactory has as yet been offered. He cites various instances of the development of acromegaly following trauma, and believes his case to belong to this category.

Exophthalmic Goitre with Monocular Symptoms and Unilateral Thyroid Hypertrophy.

Fridenberg (*Medical Record*, July 13, 1895) reports the following case: A female, aged 24 years, married, of neurotic family, and herself always the subject of nervousness, which had lately been much aggravated by domestic infelicity, had lately developed palpitation of the heart and dyspnea, with occasional sensation of throbbing in the vessels of the neck. Examination revealed marked widening of the palpebral fissure of the left side; Graefe's symptom; flushing and hyperhidrosis, especially of the left side of the face, with attending diminution in resistance to the galvanic current; enlargement of the right lobe and isthmus of the thyroid gland; fine tremor of the tongue and hands; an overacting and tumultous heart, with accentuation of the second pulmonic sound, no valvular lesion; pulse 120 per minute; blowing systolic murmur over enlarged right lobe of the thyroid; superficial respiration; insufficiency of the recti interni. "The most striking feature of the case, however, is undoubtedly the peculiar limitation of the ocular symptoms to the left side, combined with a 'crossed' hypertrophy of the right lobe of the thyroid." There are reproduced photographs of this and of another case presented elsewhere, the only cases thought to have been observed in America; and analyses of thirteen cases reported elsewhere are given.

The Causes of Incompetency in Cardiac Disease.

Weisz (*Wiener medicinische Wochenschrift*, Nos. 45 and 46, 1894) discusses at considerable length, reviewing the literature, concerning the causes of incompetency occurring in the course of disease of the heart. He concludes that the causes of the incompetency may be:

(1) Histologic changes in the muscle or nerve elements of the heart.

(2) Determining or exciting causes, as pregnancy, irrational mode of living, bodily over-exertions, emotional excitement, etc.

(3) The disarrangement, in an unfavorable direction regarding time, of the phases of the cardiac activity.

(4) With normal tissue and rational living, a mathematical enlargement of the cardiac defect.

Tachycardia.

Häusler (*Correspondenzblatt für Schweizer Aerzte*, 1894, No. 22, p. 726) reports two cases of tachycardia, the first of which is particularly interesting, because of its periodicity, its rheumatic basis, and prompt action of quinine. A male, aged 54 years, who had previously had rheumatism in the winters of 1890, 1892, and 1894, was affected suddenly with precordial anxiety and cardiac palpitation. The pulse was not countable, auscultation of the heart revealed 200–216 cardiac contractions per minute. There was no fever. Various remedies were

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used in vain, until the administration of quinine gave relief within a couple of hours. The second case was that of a female, aged 32 years, who, as a child, suffered with nervous palpitation of the heart. Following an attack of influenza she became affected with a left-sided empyema, during the course of which there occurred sudden repeated attacks of tachycardia. Auscultation revealed cardiac contractions 248–252 per minute. Ice locally, counter-irritations, brandy, and other remedies were without effect. The administration of quinine, grains three, hourly, caused cessation of the attacks. The bromides also appeared to have been of service in this case.

Early Diagnosis of Diabetes Mellitus.

Von Noorden (*Centralblatt für innere Medicin*, No. 21, 1895) emphasizes the importance of an early diagnosis in cases of diabetes, as the earlier the diagnosis is made the greater the probability of effecting a cure. When possible, an attempt should be made to diagnose the affection before it shows itself by the presence of sugar in the urine. Examination of the urine of fifteen obese persons, following the ingestion of 100 grammes of grape sugar, revealed the presence of sugar in four. Of these, two later developed true diabetes; the other two have been under observation but a short time. Von Noorden recommends that from time to time the urine of obese and gouty subjects should be examined after the exhibition of grape sugar, especially so when there is a suspicious family history, —occurrence of diabetes in other members of the family. He thinks that obesity is frequently an early symptom of developing diabetes, and speaks of "diabetogenous obesity."

Rupture of Thoracic Aneurisms.

Draper (*Boston Medical and Surgical Journal*, March 14, 1895) records notes of ten cases of sudden death due to ruptured thoracic aneurism, which, during life, had not been suspected. Of the patients, three were women, the youngest 37 years of age, the eldest 65 years. The seven men ranged in age from 30 to 77 years. The aneurisms were mostly small, and occupied various sites along the arch and descending portion of the aorta. In three cases the vertebræ were eroded. The following points are deemed worthy of mention:

(1) The rupture of an aneurism of the aorta, although it sometimes has physical exertion as its exciting cause, does not of necessity require such cause.

(2) The pericardium more often than other cavities receives the escaping blood, and in these cases it is not the amount of the hemorrhage which kills, but the inhibition of the heart-action, by compression of the cardiac walls in a sac filled to distention with blood.

(3) Deaths by aneurismal rupture, although deserving the description "sudden," are not instantaneous. An appreciable interval and sometimes a very considerable period elapses between the attack and its termination.

(4) A death by aneurismal rupture is not generally a painful one, although it may leave evidences that it is so in some cases.

(5) The escaping blood in an aneurismal rupture does not always follow the line of least resistance, and sometimes it makes a devious dissection to reach an outlet.

(6) Its small size and fusiform shape do not give an aneurism immunity from sudden rupture.

(7) An aortic aneurism is not necessarily an affair of advanced life.

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SURGERY.

UNDER THE CHARGE OF

J. WILLIAM WHITE, M.D.,

ASSISTED BY

G. G. DAVIS, M.D., M.R.C.S., AND ELLWOOD R. KIRBY, M.D.

WOUND OF THE FEMORAL VEIN TREATED BY FORCIPRESSURE.

COMMANDEUR (*Lyon Médical*, April 7, 1895) recounts the case of a man who threw some cigarette ashes in a supposed empty shell. It exploded aud tore a large wound in his thigh at Scarpa's triangle A large piece of the shell remained imbedded in the flesh. The saphenous vein was occluded with a hemostatic forceps, and on removal of the imbedded fragment profuse bleeding followed from a wound of the femoral vein. This was also stopped with a hemostatic forceps and the wound tamponned with iodoform gauze. The forceps were left on for four days and then removed, the wound healing favorably by granulation.

TREPHINING FOR THE RELIEF OF CEREBRAL PRESSURE.

J. M. CLARKE and CHARLES A. MORTON (*British Medical Journal*, April 13, 1895) report a case of brain tumor in which localizing symptoms were absent. In order to relieve the intracranial pressure, the latter removed an almost complete circle of bone two and a half inches in diameter in the parietal region. On the second night after the operation the patient was free from headache. Ten days after the operation the wound was healed and the patient was up around the wards, and said he felt as if he had a new head. Optic neuritis persisted. The general condition of the patient became much improved, and he was able to lead a comfortable existence.

LAMINECTOMY FOR CARIES OF SPINE.

GRAY (*British Medical Journal*, April 13, 1895) reports a case of Pott's disease of the spine accompanied by paralysis, in which he operated successfully. The patient was a boy aged 12 years, and the paralysis had persisted for nine months; it was complete both as regards motion and sensation. There were no rectal or bladder symptoms. The arches of the fourth, fifth, and sixth dorsal vertebræ were removed. Sensation and motion began to return the day after the operation and recovery progressed rapidly. In six weeks a plaster jacket was applied and the patient allowed to go about on crutches.

SUPRAPUBIC OPENING OF THE BLADDER.

POUSSON (*Bulletin et Mémoires de la Société de Chirurgie*, Tome XX, 1894, p. 712) points out the different indications for suprapubic cystotomy and cystostomy. The latter name is applied to the operation of Poncet, in which the mucous membrane of the bladder is sutured to the skin. Physiologically, the cystotomy opening acts as a simple fistula, leaving the urine to flow incessantly. The cystostomy opening acts as a canal with supple walls, if not actually contractile, applied one to the other, and permitting the accumulation of a certain amount of urine which

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can be expelled voluntarily. The indications for cystotomy are clear; it is the ultimate resort of the surgeon in the presence of a vesical neuralgia, of a painful cystitis, and of a persistent hemorrhage. The author performed it six times,—four for painful cystitis, one for cystitis with hemorrhage, and one for hemorrhage due to a tumor. In four of these six cases the patients were relieved of their pains and hemorrhage. The indications for cystostomy are less clear. Poncet advised it for prostatic troubles. The author relies on catheterism. He has resected the prostate in two cases, one of which recovered, but only resorted to cystostomy in a single case of perineal fistula. The operation, while it may be valuable in a small number of prostatic patients, will find its field of usefulness principally in other affections of the urethra.

In a discussion on the same subject, immediately following the paper by Pousson (page 714), Routier gives his experience. He operated by cystostomy five times for painful cystitis with one death. The fatal case was one of tuberculosis; one of the others was a blennorrhagic cystitis in a young man aged 20 years, and another was in a woman who progressed unfavorably, but who recovered by means of a subsequent vesico-vaginal opening.

For chronic troubles he operated seven times with three deaths. In those patients who recover from the operation the prostate shrinks and they again urinate by the urethra. They can retain considerable urine in the bladder.

Tuffier (page 721) said that the discussion had only brought out twelve cases in which cystostomy had been done for prostatic obstruction; this showed that the indications for it are very rare. The points decided are that the acute retention in enlargement of the prostate is to be treated by catheterism or leaving a catheter in the bladder (*sonde à demeure*); that when this course is impossible, and infection is present, and repeated punctures insufficient, then cystostomy is indicated with the object of abandoning it as soon as the prostatic congestion disappears and the prostate lessens in size, as is the rule, and resuming treatment by the urethra. Frequent micturition alone is not an indication, but persistent pain and hemorrhages are. In certain cases vesical infection is also an indication.

Suprapubic Cystostomy.

Poncet (*Bulletin et Mémoires de la Société de Chirurgie*, 1894, Tome xx, p. 730), to whom the credit of introducing the operation in France is due, gives the following statistics concerning it: Of 63 cases 21 were aseptic, and all recovered. Of the remaining 42 septic cases 15 died within fifteen days. Of 14 cases of acute urinary intoxication 11 survived from seven months to two and a half years. Of 24 cases of chronic infection, 7 died within a week, and 10 of the 17 remaining lived less than a year, and but 7 lived from a year to two and a half years. Of 34 cases that lived at least six months, in 12 normal urination was re-established; of the rest, 7 had continence, 3 partial continence, and 12 incontinence.

Actinomycosis.

Lothrop (*Boston Medical and Surgical Journal*, March 28, 1895) gives two cases of actinomycosis, and reviews the history, diagnosis, prognosis, and treatment of the affection. He states that many cases tend to recover even if left alone. As regards internal medication, iodide of potash in doses of thirty to forty grains three times daily is recommended. It is the only refuge in cases unsuitable for surgical treatment. For external medication, irrigation, and washing with corrosive sublimate, carbolic acid, and peroxide of hydrogen are to be used with

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iodoform gauze packing and applications of the solid nitrate of silver. The operative procedures are far less bold than formerly. Excisions of the maxilla are rarely necessary. One is guided by the fact that the actinomyces colonies thrive far less luxuriantly when exposed to oxygen. All abscesses should be freely opened and their walls thoroughly curetted. Pockets for pus should be obliterated and sinuses carefully followed up and laid open. General principles, applicable to all cases of septic infection, should be resorted to according to indications. Daily irrigations with the antiseptics above mentioned should be used, suspicious spots should be touched with nitrate of silver and iodoform dressings applied. If possible, small isolated foci should be incised, and, if thoroughly done, there need be no fear of recurrence. In lung and deep abdominal cases, surgical methods are of less avail, and one is forced to rely on the iodide of potash, with the hope that recent claims as regards the value of this drug in actinomycosis will reach our expectations. (In the same issue of the journal two additional cases are reported, one by Mallory and the other by Mixter.)

Resection of the Knee.

Severeano (*Revue de Chirurgie*, January, 1895, p. 41), in a case of giant-celled sarcoma, removed fifteen centimetres of the lower end of the femur. The sawn extremity of the femur was then inserted into a hole made in the articular surface of the tibia and held in place by silver wire. These were afterwards removed, and the patient in four months was cured. Six months later the cure was still complete, but, as the patient complained of the inequality of the limbs, resection of the opposite femur was proposed to him, but he declined all further intervention.

Depression of the Nose treated by the Insertion of a Metallic Support.

Chaput (*Bulletin et Mémoires de la Société de Chirurgie*, 1894, Tome xx, p. 845) describes his method of procedure in cases of depression of the bridge of the nose. It is intended to be employed when the bony support is lacking. The method of König by means of an osseous flap is regarded as unsatisfactory. That of Martin, of Lyon, in which a metallic support or tripod was used to support the skin is unsatisfactory, because the support causes suppuration and is eventually cast off.

The author's method consists in modifying Martin's by introducing the support between the skin and mucous membrane below, thus preventing infection from the nasal cavity.

The skin being intact (healthy) a U-shaped incision is made, the open end being downward. The upper part of the incision corresponds to the interval between the eyebrows. The branches of the U rests on the maxillary bones and the two ends at the lower border of the wings of the nose. The circumscribed flap is dissected up and turned downward. It is essential that in doing this the nasal cavity be not opened. Three holes are then made, one near the nasal spine and two in the maxillary bones a little outside of the alæ nasi. In order that the mucous membrane be not perforated in drilling the holes, it is dissected back from the edge of the bones about one centimetre. A tripod made of silver, gold-plated, is then introduced, and if found too large is cut smaller. When this has been fitted in place the flap is carefully sutured in place over it, silkworm gut being used. The only dressing consists in dusting on iodoform over the line of suture twice daily.

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To insure success a pattern should be first made in zinc, and afterwards a gilded silver one for insertion. The author's two cases were perfectly well ten and fifteen months after the operation, notwithstanding one had a suppuration of the lachrymal sac that exposed one of the edges of the support.

Four photographs of the patients operated on accompany the article and show most excellent results.

Three Cases of Intestinal Anastomosis by Means of Murphy's Button.

J. Ernest Lane (*Lancet*, May 4, 1895) records three cases in which he used Murphy's button. In one gastro-enterostomy was performed for cancer of the pylorus. In this case recovery was prompt, but the patient had not passed the button 160 days after its insertion. The only evidence of its presence was an occasional pricking sensation in the epigastric region. Case two was one of strangulated inguinal hernia with gangrene of the gut. This patient was in such a bad state that the hernial sac was not removed, and he was attacked with delirium tremens. He finally recovered and passed the button nineteen days after the operation. The third case was one of strangulated femoral hernia requiring a resection of seven inches of gut. This case died of shock, but good union was found at the seat of operation on the intestine.

Operation for Strangulated Obturator Hernia.

Bennett (*Lancet*, May 4, 1895) operated on a woman, aged 78 years, who was suffering with symptoms of intestinal obstruction. On opening the abdomen the part of the small intestine which was collapsed was followed down deeply into the left side of the pelvis, where it was tightly nipped under the arch of the pubes. Gentle and steady traction served to disengage a strangulated knuckle of gut about two and a half inches long, much congested and in parts ecchymosed; at one spot there was a laceration of the peritoneal surface surrounded by lymph. The damaged part was carefully cleansed and returned into the abdomen. On examining the left obturator foramen, it admitted readily the tips of two fingers, which passed through into a smooth sac of about the size of a pigeon's egg. The specific signs of obturator hernia as given in the text-books were wanting in this case. There was no fulness in Scarpa's triangle, the characteristic obturator nerve pain was absent, and nothing abnormal could be detected either by rectal or vaginal examination. The patient made a satisfactory recovery.

Contractions following Pressure on the Median Nerve by Scar Tissue.

Tubby (*Lancet*, 1895, Vol. I, p. 1111) gives the history of a child, aged 4 years, who had been suffering for one year from an injury of the front of the right forearm. At the time of the injury splints were applied and some matter came from the forearm. On examination the right elbow was found partially flexed, the forearm fully pronated, and the wrist flexed, the thumb and first and second fingers were forcibly bent into the palm, and the third and fourth fingers less so. Impaired sensation of outer part of palm and palmar aspect of thumb and first and second fingers. It was impossible to either supinate the forearm or extend the wrist, thumb, and first and second fingers, but the third and fourth fingers could be passively moved about twenty degrees.

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The median nerve was exposed at the bend of the elbow and followed down, the flexor carpi radialis being divided: two and a half inches above the wrist it was found embedded in scar tissue, from which it was freed. The divided flexor carpi radialis muscle was united with catgut sutures. Two months afterwards supination and extension were increased, but the movements of the fingers and wrists were not improved. Then the flexor tendons at the wrist were divided by isolating the median nerve and passing a blunt tenotome under it, cutting firmly towards the bone. The arm and hand were put up in a flexed position in plaster of Paris for ten weeks, when gentle extension was done. For a further period of six months the bandage was worn, the patient coming to the hospital twice a week for friction and galvanism. A year afterwards the movements of the hand were completely restored.

The complete restoration of active movement is a sufficient proof that the functions of the nerve were in abeyance owing to pressure. That more complete movement was not obtained after the first operation was due to the adaptive shortening of muscles and tendons which followed the flexed position of the hand and fingers arising from irritation of the nerve. Mere freeing of the nerve was not sufficient to correct this, although some immediate improvements followed.

THERAPEUTICS.

UNDER THE CHARGE OF

HORATIO C. WOOD, M.D., LL.D., AND ARTHUR A. STEVENS, M.D.

The Absorption of Ferratin.

Marfori (*Therapeutische Monatshefte*, March 10, 1895) states that artificial ferratin differs from other preparations of iron in being readily assimilated, and in being identical with a form of iron naturally found in the liver and other organs. The quantity of ferratin absorbed will depend on the condition of the gastro-intestinal tract. The greater its decomposition in the stomach and bowel, the less the absorption. The sulphuretted hydrogen in the intestine decomposes ferratin. Marfori found that after the use of saline purges, which disinfected the bowel, 13.7 to 41.68 per cent. of the ferratin was absorbed. Schniedeberg believes that under ordinary conditions only a small amount of ferratin is absorbed. Marfori performed the following experiment on three dogs to determine the amount of ferratin absorbed. After the bowel had been emptied by purgatives, the animal was placed upon an exclusive milk diet, and after several days ferratin was administered. The lower bowel was then emptied by enema. To the first dog 140 milligrammes of ferratin were given; 104 milligrammes were recovered from the stomach and bowel, the amount assimilated being 36 milligrammes, or 25 per cent. To the second dog 91 milligrammes were administered; 81 milligrammes were found in the stomach and bowel, the amount absorbed being 10 milligrammes, or 10.9 per cent. To the third dog 135 milligrammes were given; 94 milligrammes were recovered, the amount absorbed being 41 milligrammes, or 30.3 per cent. From these experiments the writer believes that considerable quantities of ferratin may be absorbed, even under ordinary circumstances.

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These results, according to the writer, have been confirmed by Jacquet and Kündig. Fillippo de Fillippi asserts that ferratin, unlike other chalybeate preparations, is absorbed from the intestine *en masse*. Marfori refutes the statement made by Langaard and Kobert that ferratin under normal conditions is decomposed in the stomach.

Nitroglycerin in Sciatica.

Mikhalkine (*La Méd. moderne*, January 23, 1895) reports three cases of obstinate sciatica which were greatlv benefited by nitroglycerin given in the form of the official solution in one-drop doses, three times a day. In one case, a patient, aged 44 years, in whom salicylates, acetanilid, phenacetin, quinin, antipyrin, bromides, chloral, massage, sedative ointments, and blisters failed to give relief, the following combination was entirely successful: Nitroglycerin (1-per-cent. solution), ♏ iii to ♏ xxx; tincture of capsicum, ♏ xc; peppermint water, ℥ iii. Three drops three times a day for three days, and then ten drops three times a day.

In another patient, a nervous woman, aged 45 years, with atheromatous arteries and sciatica, associated with atrophy of the muscles and hyperesthesia, the same combination in conjunction with bromides also afforded speedy relief.

The third case was a man, aged 40 years, who suffered with fever and severe pain in the right leg. A blister over the trochanter, with sodium salicylate and valerian, lowered the temperature, but failed to relieve the pain. After the lapse of four days the nitroglycerin treatment was substituted, and this promptly lessened the pain and effected a cure within six weeks, the trouble not having returned after six months.

Picrotoxin as an Antisudorific.

Semmola and Gioffredi relate (*Rif. Med.*, December 29, 1894) the case of a lady, 43 years old, who had an attack of influenza in December, 1893, with high, persistent fever, headache, and slight cough. During the long convalescence she began to suffer from sweating, which came on after the least exertion, and gradually increased until the sweat poured off her in rivulets. Together with this hyperidrosis she had dull red patches on the skin, which were more or less persistent. There was no noticeable alteration either subjectively or objectively in the nervous system. There was a slight systolic murmur at the apex, and some accentuation of the second sound of the heart in the pulmonary area. Atropine, agaricin, camphor, gallic acid, and other antisudorifics were tried, but with no effect. Semmola concluded that the sweating was due to a vaso-motor paralysis due to the action of some influenzal toxin upon the vaso-motor centre in the bulb. The presence of the dull red patches on the skin offered confirmatory evidence of this diagnosis. Since picrotoxin has a stimulating action on the vaso-motor centre, Semmola administered this drug twice a day in doses of half a milligramme each. The result was highly satisfactory. The sweats gradually diminished, and in eight days had entirely disappeared.

Liquor Cannabis Indica.

Lees, of Glasgow (*British Medical Journal*, February 9, 1895), has had excellent results from the use of a strong aqueous extract of the flowering tops of the female plant of the usual strength of liquid extracts. It possesses the anodyne and soporific action generally ascribed to the resinous extract, although in a

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modified degree. It has the characteristic odor of the hemp, a beautiful deep amber color, is miscible with water, and hence there is no difficulty in combining it with other liquids. Liquor cannabis indica, in his experience, gives all the beneficial effects without the drawbacks of the tincture, avoiding those extreme exhilarating conditions bordering on intoxication, which are sometimes met with even when using a medium dose of the latter. It does not seem to interfere with the secretion of mucus from the bronchial glands,—a circumstance which renders it superior to opium in cases suitable for its use, whilst in pulmonary affections generally it acts most favorably as a soporific and anodyne. The author speaks highly of its effect in phthisis, where it relieves the cough and stimulates and exhilarates the patient. It is also valuable in indigestion and constipation. The dose commonly used by him was one-half fluidrachm for an adult, though in many cases it may be increased to one drachm. The dose for children is proportionate, though Dr. Lees observed that young patients were somewhat less susceptible than grown persons.

Thyroid Feeding in Insanity.

Bruce (*Journal of Mental Science*, No. xli, 1895), having employed thyroid extract in twenty-three cases of insanity, including mania, general paralysis, puerperal, lactational, climacteric, syphilitic, and alcoholic insanity, draws the following conclusions:

(1) By the internal administration of thyroid, a true febrile process can be induced, and the resulting reaction is beneficial to the patient.

(2) The amount of the drug necessary to induce physiological action varies in different individuals, but it is seldom necessary to give a larger dose than sixty grains of the extract daily.

(3) Excessive and prolonged administration of thyroid extract produces gastric irritation.

(4) The use of thyroid in the treatment of the insane is accompanied by a certain amount of danger from induced heart-weakness. This danger can be minimized and almost discounted by confining the patient to bed during treatment and for some days afterwards.

(5) The administration of thyroid is contra-indicated in cases of mania where the excitement is acute, the loss of body-weight rapid, and there is danger of exhaustion from malassimilation of food.

(6) Thyroid treatment appears to be specially useful in the insanity of the adolescent, climacteric, and puerperal periods.

(7) Its exhibition is frequently useful in cases where recovery is protracted.

(8) In cases of long standing, where there is a tendency to drift into dementia, a course of thyroid treatment sometimes gives the necessary fillip which leads to ultimate recovery.

(9) Patients under treatment should be kept in as equable a temperature as possible.

(10) As far as the observations on general paralysis go, the results are sufficiently satisfactory to make me hopeful of benefit if the patient is treated at an early stage of the disease.

(11) Finally, such results as I have given cannot fail to make an impression on those who have the responsibility of treating the insane, and are anxious to use every method to help in furthering their cure. I believe that in thyroid-feeding we possess a valuable addition to our armamentarium in the treatment of certain cases of insanity.

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The Action of Chloride of Sodium on Metabolism.

Dr. Angelo Pugliese (*Archivio di Farmacologia e Terapeutica*, Vol. III, Fasc. 6, June, 1895), in a series of experiments in the Laboratory of Physiology of the Royal University of Siena, gives a *résumé* of the results obtained. It can be said that after the addition of a sufficient dose of common salt to the food there occurs,—

(1) A considerable increase in the weight of the animal.
(2) No change in the amount of urine by volume that is secreted.
(3) A considerable diminution in the elimination of nitrogenous material.
(4) An increase in the coefficient of the digestibility of proteids.
(5) A sensible increase in the elimination of chlorides.
(6) Variations that are scarcely appreciable in the elimination of phosphates.
(7) A notable diminution of the quotient $\frac{U}{P_2O_5}$; $\frac{N}{P_2O_5}$,—that is, during the administration of the sodium chloride as the excretion of urea and of nitrogen is diminished, while the elimination of phosphoric anhydride remains unchanged, or is increased, there is necessarily a decrease in the ratio of these substances, as expressed above.

When sufficiently large doses of sodium chloride are given through the intestinal tract, its passage into the urine does not begin for some hours. It only reaches its maximum fourteen to twenty hours after ingestion.

The ingestion of sodium chloride in such doses produces an increased elimination of potassium bromide; there seems to be a peculiar relation between the salts of the two metals, so that while the amount of both always remains practically the same, either one may exist under special circumstances greatly in excess of the other. [Translated by James J. Walsh, M.D.]

To What is the Acidity of Parotid Saliva Due?

Dr. Giov. Dotto (*Ibid.*). The acidity is not altered by exposure to the air; it is not modified by being submitted for hours to a diminution of the normal pressure of the air down to eleven centimetres of mercury; finally, it remains unchanged even when the saliva is evaporated to dryness over a water-bath.

The acidity then is not due to the presence of an acid that will volatilize with vapor of water, but to some non-volatile acid, or more probably to some acid salt; for example, the acid phosphate of sodium. [Translated by James J. Walsh, M.D.]

Zinc in Anemia.

During last year the beneficial effects of copper in anemia were shown by a series of careful observations in the Medical Clinic of the Royal University of Palermo (*Archivio di Farmacologia e Terapeutica*, Vol. III, Fasc. 5, 1895). This year zinc is being experimented with. Sulphate of zinc was employed in doses of from one to six centigrammes twice a day at meal-times. No other drugs were used during the treatment, and the diet was always the same before and during the observations.

It is interesting to note that the hemaglobin value constantly and rapidly rises from the first days of the administration of the drug till it reaches almost a maximum, which is almost constantly maintained.

It would seem that zinc can with success be made to replace iron, not only in the treatment of chlorosis, but also in the secondary anemias.

The preparations of zinc have never given rise to any gastric or intestinal disturbances so that in many cases they would be preferable to the chalybeates.

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Besides the noteworthy increase of the hemoglobin value of the blood there was, as might be expected, a corresponding increase in weight and amelioration of the general health, so that the drug may take the place in all respects of the ferruginous tonics.

These results are all the more striking as the observations made upon animals would not have led one to presuppose that the zinc salts would have this effect. [Translated by James J. Walsh, M.D.]

Phenylsulphate of Magnesia.

This is prepared by the double decomposition of the phenylsulphate of barium and the sulphate of magesium being used on account of its slight toxicity as an internal antiseptic in doses of 1 to 2 grains. (From *Archivio di Farmacologia e Terapeutica*, Vol. III, Fasc. 5, 1895.) [Translated by James J. Walsh, M.D.]

On the Behavior of Caffeine and Theobromine in the Organism.

Dr. M. Albanese (*Archiv für exp. Pharmakologie und Pathologie*) observes that when caffeine is administered to dogs in large doses by the mouth, about 7 per cent. of it passes unchanged into the urine. Ten per cent. more of it is found in the urine as monomethylxantine, —a substance which, according to the author's researches, is to be considered as an intermediate product of the final transformation of caffeine into urea and ammonia.

Theobromine behaves analogously, only in the case of this drug the transformation is less rapid and less complete. The series of chemical changes induced are the same as take place when theobromine is exposed to the action of oxidizing agents outside the body. After digestion, 3 per cent. of it is found as such in the urine and 20 per cent. as monomethylxantine. In rabbits monomethylxantine cannot be detected in the urine, but in its place there exists a mixture of bases of xantine and the substance xantine itself. This shows a further stage of the passage of caffeine into the end products of its transformation.

In man the ingestion of tea or coffee produces a very sensible increase of the bases of xantine that are to be found in the urine, but it is impossible to demonstrate the presence of either caffeine or monomethylxantine. After a very large dose of caffeine only the imponderable of the drug could be found in the urine, though about 10 per cent. of it seemed to exist there as a base of xantine, which was probably dimethylxantine. This seems to represent a stage of transformation not so far advanced as in the case of dogs and rabbits.

As regards monomethylxantine, this also undergoes transformation in the organism, and when injected only traces of it can be found. It possesses diuretic properties analogous to those of caffeine, only to a more marked degree. [Translated by James J. Walsh, M.D.]

Peristaltic Movements of the Muscular Coats of the Stomach.

According to the experiments of A. Lamy (*Journ. de Méd. et de Chirurg.*, January 1, 1895) water at 4° C. excites the peristaltic movements of the muscular coats of the stomach two and a half times as much as water at the ordinary temperature, 15° C. At higher temperatures, however, the difference in not so great, and at 37° C. the warm water is a more powerful motor excitant than the cold. The same thing holds good for food of diverse materials.

As regards glandular secretion, the temperature of the substances ingested exercises an exactly opposite influence. While peristalsis is greatest at 37° C., gastric secretion is most active when the ingesta are at 4° C. Water at ordinary temperatures has much less influence than at either extreme.

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Lamy concludes that when it is desired to excite gastric peristalsis it is best to give food warm,—*i.e.*, from 37° C. to 60° C., when there is question of stimulating gastric secretion to give food cold,—*i.e.*, about 4° C. [Translated by James J. Walsh, M.D.]

New Remedies.

Under the name of tussolo, Amygdalate of Antipyrin is acquiring a reputation in Italy as a remedy for whooping-cough. It is given in doses of 0.05 to 0.10 grains (three-quarters to one and a half grains) to infants two to three times a day.

Valerianate of Amyl seems to give good results in cases of bilious colic, not only as a sedative, but by aiding in the expulsion of the calculus. It does not act so well in nephritic colic. Dose, in capsule, 0.15 grains (two to three grains), two to three times a day.

Bitartrate of Cesium has been used by Shaeffer in nervous heart-stroke (angina pectoris?) with good results, in doses 0.18 to 0.30 grains (three to five grains), three times a day. It is expensive, however. (*Archivio di Farmacologia e Terapeutica*, March, 1895.) [Translated by James J. Walsh, M.D.]

Experimental Contribution to the Physiology of the Thyroid.

N. Dedominices (*Gironale dell Associazione Napoletana di medici e naturaliste*, Anno v, punt 2) says,—

(1) Thyroidectomy, when total, brings on, in from two to four days, rarely later, certain dystrophic and serious nervous phenomena that almost inevitably cause the death of the animal.

(2) The cases in which these effects fail to be produced are very exceptional, and the true reason for them is not yet surely known. We may admit a vicarious development of succenturiate thyroids, but it cannot be denied that there may be other modes of compensation as yet unknown to us, and this seems absolutely so suggested by certain results of the experiments.

(3) The morbid condition to which thyroidectomy gives rise is due to a direct autointoxication, which affects principally the central nervous system. The thyroid seems to have the function of neutralizing certain toxic products that are continually circulating in the blood and which gradually accumulate in the system, producing serious and fatal effects without the intervention of the thyroid secretion.

(4) There is absolutely no connection between the function of the thyroid and that of the spleen.

(5) The implantation of the thyroid in another part of the body, if successfully done, never fails to prevent the fearful and fatal effects of thyroidectomy.

This is very different to what happens when a successful attempt is made to transplant the pancreas. [Translated by James J. Walsh, M.D.]

Dilatation of the Pupil.

Dr. Francesco Spallita contributes an article (*Archivio di Farmacologia e Terapeutica*, Vol. III, Fasc. 3, March, 1895), on the mechanism of dilatation of the pupil by excitation of sensory nerves, from the Laboratory of Physiology of the Royal University of Palermo.

The experiments were performed on two dogs in which complete extirpation of the Gasserian ganglion was done after the thorough removal of the cervical sympathetic; subsequent autopsy showing in each case that no portion of these structures had been unwittingly left. The animals were submitted to experimentation twenty-three and fourteen days respectively after the operations, while under the influence of curari and with artificial respiration to maintain life.

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The results show the possibility of obtaining reflex pupillary dilatation after the complete abolition of the dilator nerve fibres as we know them up to the present time.

Dr. Spallita suggests, as a probable explanation of the phenomena observed, the hypothesis that the excitation of a sensory nerve besides producing an active dilatation of the pupil by means of the dilator fibres mentioned, may also determine a passive dilatation by inhibition of the reflex power of the oculo-motor.

He considers his experiments as supporting what was, according to him, a favorite theory of Brown-Séquard's towards the end of his career, that there does not exist in the organism a particular path for inhibition, but that the whole nervous system is in communication by dynamogenesis (origination of nervous impulses) as well as by inhibition. [Translated by James J. Walsh, M.D.]

Disinfection of the Alimentary Canal.

Dr. Carmelo Calderone (*Archivio di Farmacologia e Terapeutica*, Vol. III, Fasc. 2, February, 1895) reports a series of experiments performed in the Laboratory of Experimental Pharmacology of the Royal University of Messina, with the view of determining what drugs act most effectively in producing disinfection of the alimentary canal. The intensity of the processes of decomposition which take place in the intestines is assumed, in accordance with recent observations, to be measured very exactly by the quantity of sulphuric acid in combination which appears in the urine. The effect of the drugs was studied by noting the diminution of the combined sulphuric acid as indicated by Salkowsky's method.

His conclusions are:

(1) The fundamental idea of the origin of the sulphuric ethers of the urine from putrefaction of the contents of the intestine is confirmed.

(2) Only iodoform and calomel are capable of causing the complete disappearance of the sulphuric ethers from the urine. The iodoform acts by being decomposed in the intestines when iodine is set free. The ordinary therapeutic doses of calomel do not bring about complete disinfection of the intestines, but it is more effective than camphor, menthol, turpentine, eucalyptus, or salicylate of bismuth, though these also distinctly lessen the elimination of combined sulphuric acid in the urine.

(3) It is especially the pancreatic juice which determines the processes of advanced putrefaction in the intestinal contents. The bile has a distinct but slighter influence in this respect. (These conclusions come as the result of observations made after the removal of the pancreas in certain experiments, and of the application of ligatures to the common bile-duct in others.)

(4) Experiments made on frogs give negative results, the synthetic processes that lead to the production of sulphuric ether not taking place in the batrachian and presumably not in cold-blooded animals.

(5) The elimination of sulphuric acid in combination takes place by the same ways as that of urea. Hence, when the kidneys are removed, it accumulates in the blood and in the organs, especially in the liver, and can be demonstrated in abundance in the vomit. [Translated by James J. Walsh, M.D.]

Ferripyrine, a New Hemostat.

Dr. Carmelo Calderone (*Archivio di Farmacologia e Terapeutica*, Vol. III, Fasc. 2, February, 1895). It is a double compound of the chloride of iron and antipyrin—formula $Fe_2ClO_3(C_{11}H_{12}N_2O)$. It is a fine powder of a beautiful orange-red color, easily soluble in water, to which it gives a dark red color. It has the same indications as the perchloride of iron, but in a more striking degree lacks some of the objections, and seems to many preferable as a hemostat. [Translated by James J. Walsh, M.D.]

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THE WAYS IN WHICH EXTENSIVE BURNS AFFECT THE GENERAL SYSTEM.

DRS. BOYER and GUINARD (*Gazetta Medica di Roma*, Anno XXI, Fasc. 7) submitted dogs to the action of boiling water, and carefully studied their condition. At first blood-pressure rises, the respirations are accelerated, and the animal is violently agitated. This phase is only passing, and soon a rapid lowering of pressure and of temperature and a slowing of respirations are noted.

Sonnenburg maintained that the depression was due to the rise in temperature of the blood, but these experiments seem to show that unless under exceptional circumstances this was not a factor in the results.

Immediate immersion of the scalded animal in cold water caused the suppression of the primary rise of temperature, but seemed to add to the severity of the consequences of the burn.

The animal may fall into immediate collapse, the result of nervous "shock."

At the end of this first stage there comes a second more interesting one; the temperature rises, respiration remains tranquil, there is diarrhea, vomiting, restlessness, delirium, spasms, even convulsions, finally prostration. Meantime there develop multiple hyperemias all over the body, in the meninges, the brain, medulla, lungs, pleura, intestinal tract, liver, peritoneum, kidneys, etc.,—hyperemias that become congestions, even inflammations. In a word, there are all the symptoms and lesions of the severe fevers, or of poisoning by toxines.

Many authorities have found in the organs, in the blood, and especially in the urine, toxic substances which they have isolated and tested by inoculations. Drs. Boyer and Guinard have obtained similar results in studying the toxicity of the urine of dogs in whom one whole side of the body had been scalded. They have collected urine from such cases which killed rabbits when injected in the proportion of 147, 81, 70, 12, and even 9 cubic centimetres to each kilogramme of body weight.

The urine in these cases is diuretic, causes torpor, interrupted at times by spasms and convulsive phenomena. It also causes contraction of the pupil, exophthalmos, and dyspnea.

With the urine of men who had been burned they succeeded in producing the same effects.

The organism of a burned person manufactures toxines in large quantity and of characteristically noxious quality. These are produced by tissue that is destroyed, or in process of destruction, by changes in the tissue juices, and especially by blood changes that have been noted by a number of authors.

As regards the asphyxia that is said to be produced by the blood changes, they found that the total quantity of gas in the blood was diminished, but the carbonic acid was diminished even more than the oxygen, showing that there was an arrest of metabolism, but not asphyxia.

They came to the following conclusions:

The burned person is first threatened with collapse, and then comes the danger of intoxication.

The first indication is to combat the pain, the nervous shock, and the depression; the great contra-indication is not to bring on a chill by the use of cold.

The diffusible stimulants, ether and caffeine, are indicated, and there may be a question logically of transfusion or of the injection of artificial serum. If the blood-pressure is sufficiently high, bleeding should be thought of, and this method is, perhaps, too timidly praised.

It will be very useful to provoke by every possible means an abundant diuresis; while the slowing of the processes of oxidation and the presence of the toxines call for the repeated use of inhalations of oxygen. [Translated by James J. Walsh, M.D.]

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OBSTETRICS.

UNDER THE CHARGE OF

BARTON COOKE HIRST, M.D.,

ASSISTED BY

RICHARD C. NORRIS, M.D., AND FRANK W. TALLEY, M.D.

On Compression of the Ureters by the Gravid Uterus and Consecutive Pyonephrosis.

Dr. Bonneau (*Revue de Chirurgie*, No. 4, p. 349, 1894) states that compression of the ureters by the gravid uterus is not uncommon. More often it affects the right side. It is insufficient in itself to produce eclampsia, but may be a predisposing factor in its production. The incomplete retention of urine may, by constituting the upper parts of the urinary tracts a locus of least resistance, give rise to lesions of the kidney, which may be followed by pyonephrosis. Should any infection of the blood of intestinal or other source supervene, the pathogenic germs arrested in the infected kidney will produce a descending nephritis, which is not alarming, since after the parturition recovery is spontaneous.

On the Technique of the Induction of Premature Labor.

Müller (*Münchener medicinische Wochenschrift*, XLI, 4, 1894) reports the following case: Mrs. F., aged 41 years, rachitic, having diagonal conjugate of 9.5 centimetres, severe struma, XIV-para, delivered three times by artificially-induced premature labor. Her children, except one boy, died in birth, soon after or within two and a half years. The previously induced premature labors, which were induced by the passage of a bougie, lasted five days fourteen hours, thirteen hours, and eight days nine hours respectively. The fifteenth pregnancy was interrupted at the seventh month by Pelzer's method of injecting 100 grammes of sterilized glycerin. Ten minutes after the injection there was vomiting, the bowels acted, and a rigor of one hour's duration occurred. With severe dyspnea the temperature mounted to 40.5° C. (104.9° F.), and the pulse to 156. Twin birth occurred. After eighteen hours, the first child, weighing 790 grammes, was expelled, and died in one and a half hours. Forty-eight hours after, the second one was expelled dead, and weighing 850 grammes. The temperature dropped quickly to 38° C. on the second day. The patient was discharged on the seventh day. During labor, and for a few days afterwards, the urine was a dark reddish-brown color, produced by the presence of methemoglobin and hematoporphyrin.

Regarding the quickness of action, the Pelzer method in this case corresponded to Müller's expectations, but the reaction was so trying that it appears clearly indicated that one should use a less quantity of glycerin in the future.

Müller considers that the reflex stimulation of the heat centres through the irritation exercised upon the uterus was the cause of the repeated rising of temperature.

On the Local Treatment of Puerperal Endometritis.

J. A. Ten Bokkel Huinink (*Nederlandische Tijdschrift and Verlosk en Gynecologie*, Vol. V) reports that in the obstetrical clinic of Professor Van der Mey, whenever any such fever occurs during puerpery as can only be attributed to infec-

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tion of the genital tract, a most careful examination is made. If any ulceration due to a puerperal lesion be found, after disinfection with sublimate solution, the vulva and vagina are painted with tincture of iodine. If after this the temperature does not decrease, the cavity of the uterus and the cervical canal are—after having been thoroughly disinfected with a solution of corrosive sublimate or carbolic acid—swabbed out with the tincture of iodine.

Fifty-two observations from the Professor's clinic show that the treatment, if not unduly delayed after the appearance of the fever, is found in most of the cases to arrest its development.

Artificial Abortion.

Garrigues (*American Gynecological and Obstetrical Journal*, June, 1895) believes that the conditions which justify artificial abortion, apart from acute diseases, are, especially serious pulmonary tuberculosis, severe valvular heart-disease, aortic aneurism, carcinoma not amenable to radical treatment, chronic nephritis, severe affections of the nerve centres, and present or threatened insanity. Abortion offers two dangers, hemorrhage and septicemia. The evacuation of the uterus should be conducted under anesthetics with every precaution. The cervix is dilated by means of conical hard rubber and expanding steel dilators until there is room enough at least for a curette, but if possible for a finger besides. The spongy endometrium should be removed thoroughly, as well as the fetus and membranes. Garrigues scrapes as long as anything comes out. Before scraping, the uterus is washed out with creolin, and afterwards a quart of 1 per cent. solution of that drug is passed through the uterus by irrigation. Drainage is not needed during the first two months; the vagina need only be plugged for a day. Later the uterus should be packed with iodoform gauze, gradually withdrawn daily so as to give the organ a chance of contracting well before the last of the packing is removed, from four to six days after the operation. After the end of the fourth month the measures used for the induction of premature labor are indicated, especially dilatation of the cervix, introduction of a bougie, and packing of the cervical canal with iodoform gauze. No artificial abortion should be performed without a consultation report, signed by the consultant and kept by the operator.

Edema and Prolapse of Cervix in Pregnancy and Labor.

Geyl (*Volkmann's klinische Vorträge*, No. 128, May, 1895) describes a second case of this rare condition seen in his own practice. Five have already been collected by Guénist, the discoverer of the disorder in question, and one by Misrachi; thus eight cases complete the series. Geyl makes use of the formidable name "edema acutum cervicis uteri gravidi parturientis seu puerperalis intermittens," which also forms the title of his monograph. In Geyl's last case he first saw the patient on February 19, 1894. She was in the seventh month of pregnancy, and complained that a body frequently protruded from the vulva and went up again. A sanious mucous discharge ran from it as long as it was down. A year previously Geyl had used the curette for endometritis. He had opportunities for examining the prolapsed body. It was a cylindrical structure two and a half inches outside the vulvar cleft, ending in a blunt extremity nearly two inches wide. It pitted on pressure of the finger, the depression disappearing directly the finger was removed. On careful exploration it was found to be the anterior lip of the cervix. The chief examination was made on March 24, when labor pains were suspected. After rest with elevation of the pelvis the swelling disap-

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peared. It came down again daily before labor. On the night of April 7, precipitate labor occurred, the child being delivered after four pains only, when the patient had been one hour in bed; the placenta soon followed. Geyl arrived when all was over. The uterus was perfectly normal. Ten days later the anterior lip of the cervix felt simply a little larger than the posterior. As reduction is usually spontaneous, and as this case shows that labor is but little affected, edema of the anterior lip is hardly to be considered a dangerous complication of pregnancy. It presents, however, a formidable appearance, and, therefore, obstetricians should be aware of its true nature.

The Gases in Woman's Milk.

Külz (*Zeitschrift für Biologie*, Vol. xxxii, part 2, 1895) has analyzed human milk, and in so doing has taken every precaution to prevent the entrance of air from without before making the analysis. Hoppe-Seyler, in 1859, made out the proportions of the most abundant gases, as follows: Oxygen, 0.16 per cent., carbonic acid, 1.88 per cent., and nitrogen, 1.38 per cent. More recent authorities give conflicting evidence. Setschenow and Pflüger found carbonic acid in much larger proportion (6 or 7 per cent.). As the result of careful analysis of five samples from three women, Dr. Külz has arrived at very uniform proportions; in fact, roughly speaking, the gases stand at, oxygen, 1.5 per cent., carbonic acid, 2.5 per cent., and nitrogen, 3.5 per cent.

In all five samples the gases kept the same figures as above indicated with but slight variation in decimals.

Retention of Urine in a Fetus.

Devé (*Annales de Gynécologie et d'Obstétrique*, June, 1895) states that he found nearly seven pints of urine in the distended bladder of an eight-months fetus. Nearly one inch of the urethra was reduced to an impervious fibrous cord. The rectum ended in the bladder. The urine only contained 0.024 milligrammes of urea to the litre. Porak relates the case of double hydronephrosis due to an incomplete valvular stricture of the membranous part of the urethra. In a similar case to Devé's the urine was as deficient in urea. Hence, the fetal kidneys probably eliminate nothing but water with chloride of sodium in the proportion which that salt holds to the blood. The true renal functions in intra-uterine life are discharged by the placenta.

A Case of Fetal Ascites; Albuminuria and General Anasarca of the Mother during Pregnancy; General Edema of the Fetus and Fluid Distention of the Fetal Abdomen; Hypertrophy of the Placenta.

Grimsdale (*Liverpool Medico-Chirurgical Journal*, January, 1895) records the following history: Patient, 34 years old, has had four pregnancies, one of which was a miscarriage. The previous labors were normal. For the first seven months of the present pregnancy she had good health, then dropsy appeared suddenly in the feet, and quickly spread in the following few days till it became general. Albumin was present in the urine, as was also a good percentage of urea. The general health then continued fairly good and the anasarca gradually increased. The distention of the abdomen was enormous. The abdominal enlargement had

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been much greater than usual from the fourth month on. At term she went into labor, and as the dilatation of the os was very slow, the membranes were ruptured. A quantity of liquor amnii, estimated at about six quarts, escaped. Labor progressed slowly, the head presenting in occipito-posterior position. When the os was fully dilated the forceps was applied, and after considerable difficulty the head was born. The body, however, did not follow. The arms were pulled down and, while pulling on the head and arms, the neck was felt to give way, and it was found that the head was only attached to the body by a tag of skin. At this period Dr. Grimsdale was called and found the patient in fair condition. The head and arms of the fetus were very edematous, and pitted on pressure. When the arms were pulled on with even slight force, the skin cracked and the sodden, distended, adipose tissue protruded through the crack in the skin. On passing the hand into the uterus the distended abdomen of the fetus could be easily felt. This was punctured, and the child was born without further difficulty.

The ascitic fluid was of an amber color, quite clear, and not flaky. The quantity was estimated at about two to three pints. The placenta followed shortly; it was large, measuring ten to eleven inches, and weighing three and a quarter pounds. The mother at the time of reporting, which was five months after labor, was in good health and there was no albumin in her urine.

On autopsy upon the child, besides the general edema, the surface of the body and limbs was covered by petechiæ, circular, and about one-eighth inch in diameter. The abdominal wall was nearly an inch in thickness. There was a quantity of clear yellow fluid in the abdominal cavity. The spleen was large.

Grimsdale believes that the disease is primarily fetal and that the condition of the mother is secondary in most cases. The course of events he takes to be a disease of the fetal liver and kidneys causing general dropsy and ascites of fetus and hydramnios; secondary to these, maternal nephritis.

The Care of the Navel.

Doktor (*Archiv für Gynäkologie*, Bd. xlv, H. 3) reports his experience relative to the treatment of the umbilicus in new-born infants, and the prevention of infections. In new-born infants the navel forms a columnar projection of the skin, on the top of which the cord is attached, a sharp line of demarcation, the navel ring, separating the cord from the skin. On its margin are numerous vessels that go to the border of Wharton's jelly, but do not enter into it. When the cord is ligated, its tissues lose their viability and must separate and fall away, leaving the wound covered with a living structure. We must regard the navel as a physiological wound of the abdomen of the new born, its healing differing in no way from that of any other wound, the only peculiarity being the topography of the wound. In typical cases it heals by first intention. This small wound is especially liable to infection and resultant maladies, severe or light:

(*a*) Because of its condition, it is not merely a wound of the abdominal skin, but also of its wall, and in close proximity to the abdominal membrane (peritoneum), which is very susceptible to infection.

(*b*) The peculiarity that these great vessels lie free in this wound.

(*c*) The third great factor tending to infection is the disproportionately large mass of dead tissue,—the remains of the cord.

(*d*) This wound is peculiarly inclined to an excessive formation of granulations.

(*e*) The frequency of development of anomalies and aberrations of the umbilicus also predisposes it to disease.

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According to Erös, 68 per cent. of umbilical wounds do not heal in a normal manner; and of these cases 45 per cent. suffer from fever. How often these cases terminate fatally is not known. In treating the navel, the aim is to obtain healing without infection. The ordinary method is to ligate the cord some eight or ten centimetres from the body and wrap it in an oiled rag after careful disinfection with sublimate solution, 1 : 1000, and then binding it to the abdomen with a bandage. At each bathing of the child the cord is washed, and if there be not much secretion a new bandage is applied or a cotton pad is placed over the navel first. Too often cleanliness in the latter matter is neglected by the nurse. The author omitted the oiling of the rag in the above method as it hindered mummification. The temperature was taken twice daily. Iodoform was applied to the wound or, if needed, a weak carbolized wash. With the above treatment 35 per cent. of cases had fever, and of these 16 per cent. showed infection. The plan was then changed. The cord was removed as early as possible and all wetting omitted. The bandage was changed daily. After this 25.8 per cent. showed a rise of temperature, and of these 10 per cent. had infection. Further improvement resulted when efforts were made to hasten mummification of the cord. Ligatures applied closely to the belly were next tried, the stump being one centimetre long. This gave 11.88 per cent. of fever, and 3.46 per cent. of infection. As a general rule, fever occurring during the healing of the navel is due to infection, notwithstanding the failure of local symptoms, and especially the coincident frequent digestive disturbances cause no fever. The author summarizes the treatment of the umbilicus as follows:

(1) Cut the cord as close as possible.

(2) The bandage once applied, should not be changed except for good cause, and preferably the bath should be omitted.

GYNECOLOGY.

UNDER THE CHARGE OF

CHARLES BINGHAM PENROSE, M.D.,

ASSISTED BY

WILLIAM A. CAREY, M.D., AND H. D. BEYEA, M.D.

THE PARASITES IN UTERINE CARCINOMA.

MÜLLER (*Archiv für Gynäkologie*, Bd. XLVIII, Heft 2) reports that he has made careful examination of the carcinoma-cell contents for parasites in twenty-one cases of uterine carcinoma. The result was that in one case of carcinoma of the posterior lip of the cervix he saw three cyst-formed bodies which were pale and glassy, with a colorless membrane. They are minutely described and shown in drawings. Smaller cyst-like bodies with and without contents are also shown. Besides these, in the same case, intracellular bodies without a capsule were found. These parasites, according to Müller and others, are ameboid organisms. The encapsulated is probably the more constant form of intracellular ameboid. He believes that their presence cannot be positively proven in fixed preparations. They must be seen in living tissue at pure culture.

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Post-Climacteric Hemorrhage from the Genital Tract.

Neuman (*Monatsschrift für Geburtshülfe und Gynäkologie*, Band I, Heft III), with a very extensive review of the literature upon the cause of hemorrhage from the genital tract after the cessation of menstruation, reports a series of 1000 cases, collected in the Schauta clinic in Vienna, in reference to this subject. His conclusions from the literature review are that hemorrhage at this time is almost always due to disease; that it is rarely normal. The diseases producing it are various: nervous conditions with vaso-motor derangement; heart-failure with phenomenon congestion, local diseases, as erosion, ulceration, mucous polyps, carcinoma of the cervix and body of the uterus, and sarcomatous degeneration of a myoma. The writer, in observing 12,000 gynecological cases during the last six years, has attempted to learn the significance and importance of this symptom. Of these 12,000 cases, 1000 were beyond 45 years of age. He separates these 1000 cases into two groups, as shown in the following tables: The first group represents the diseases seen in climacteric period, and the second group those seen in the post-climacteric.

First Group.

Diagnosis.	Number of Cases.	Relative Frequency.	Comparative Age.
Carcinoma of the vaginal cervix	100	20 per cent.	45.5
Displacement of the uterus and peri-uterine inflammation	75	15 "	46.5
Myoma	70	14 "	48
Climacteric anomalies	55	11 "	47
Prolapse of the vagina and uterus	55	11 "	47
Endometritis	20	4 "	46.5
Carcinoma of the corpus uteri	11	2.2 "	41.3
Ovarian cyst	10	2 "	46.5
Pregnancy	8	1.6 "	45.5
Various diseases of the genitals	61	12.2 "	48.5
Questionable diagnosis	35	7 "	47
Total	500	.....	46.5

Second Group.

Diagnosis.	Number of Cases.	Relative Frequency.	Comparative Age.	Appearance of Menopause.
Prolapse of vagina and uterus	112	22.4 per cent.	59	46.5
Carcinoma of the vaginal cervix	103	20.6 "	56.5	47.7
Colpitis senile and senile changes in the genitals	85	17 "	55	47
Displacement of the uterus and peri-uterine inflammation	35	7 "	49.2	47.5
Ovarian cyst	25	5 "	60	47
Carcinoma of the corpus uteri	18	3.6 "	57.4	49.5
Myoma	14	2.8 "	56	50
Mucous polyp of the uterus	8	1.6 "	55.4	47.25
Various diseases of the genitalia	60	12 "	58.8	44.8
Questionable diagnosis	40	8 "	59.5	46.5
Total	500	.....	56.2	46.7

The last, the post-climacteric cases, are again separated, showing the disease associated with and without hemorrhage as a symptom.

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THIRD GROUP.

POST-CLIMACTERIC CASES.	WITH HEMORRHAGE.			
Diagnosis.	Number of Cases.	Relative Frequency.	Comparative Age.	Appearance of Menopause.
Carcinoma of vaginal cervix	100	20 per cent.	56.2	47.7
Prolapse of vagina and uterus	24	4.8 "	59	43.6
Carcinoma of corpus uteri	18	3.6 "	57.4	49.5
Mucous polyp of uterus	8	1.6 "	55.4	47.25
Colpitis senilis and senile change of the genitalia	5	1 "	63.6	49.4
Myoma uteri	4	.8 "	68	51.3
Ovarian cyst	4	.8 "	54	45.5
Questionable diagnosis	20	4 "	61.7	47.4
Displacement of the uterus and old inflammatory disease				
Various diseases of the genitalia				
Total	183	36.6	56.5	46.5

POST-CLIMACTERIC CASES.	WITHOUT HEMORRHAGE.			
Diagnosis.	Number of Cases.	Relative Frequency.	Comparative Age.	Appearance of Menopause.
Carcinoma of vaginal cervix	3	0.6 per cent.	70.3	48
Prolapse of vagina and uterus	88	17.6 "	59.2	47.6
Carcinoma of corpus uteri				
Mucous polyp of uterus				
Colpitis senilis and senile change of the genitalia	80	16 "	54.2	46.7
Myoma uteri	10	2 "	53.3	49.4
Ovarian cyst	21	4.2 "	58.2	47.7
Questionable diagnosis	20	4 "	58.5	46.1
Displacement of the uterus and old inflammatory disease	35	7 "	49.2	47.5
Various diseases of the genitalia	60	12 "	58.8	44.8
Total	317	63.4	56.1	46.9

It is to be noticed that more than half of the hemorrhage cases (54 per cent.) are carcinoma of the cervix. As regards the actual cause of hemorrhage he believes that in the prolapse cases it was due to erosin, senile colpitis and epithelial defect, or the vaginal mucus was so vulnerable that the slightest touch would cause bleeding. In the two cases of myoma it was because of a submucous polyp. As regards the ovarian cysts the cause is uncertain. In the twenty cases where no definite diagnosis was made he was unable to determine the cause. The occurrence of hemorrhage after the menopause is, therefore, easy to determine and of little importance when the site of hemorrhage can be seen, but when from the uterine cavity a diagnosis at once becomes of the greatest importance. Borner believes that many times it is due to vaso-motor change. The writer also believes this, but strongly advises that the endometrium be examined microscopically in every case. In but one of the cases he has observed was the hemorrhage a result of a general venous congestion. Instances have also been reported by Puech and Krieger where the menstrual function has been re-established and the women born children. The twenty-nine cases of carcinoma of the corpus uteri reported in the above tables were proven microscopically. Eighteen (62 per cent.) of the twenty-nine the women had passed the menopause from two to seventeen years. The usual

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history was that the patient had previously been healthy, and that suddenly, without cause, a severe hemorrhage had occurred, which she had believed was the result of heavy lifting. The hemorrhage returned irregularly, and in the interval there was a leucorrheal discharge usually containing blood. Sometimes the hemorrhage lasted a month. Thus the hemorrhage is always chronic, severe, and irregular, and not unlike that of cancer of the vaginal cervix. The failing health and characteristic appearance of the patient is also of great significance. Neuman believes that where chronic and severe metrorrhagia occurs in a woman who has passed the menopause, and she is failing in health and becoming anemic, a diagnosis of carcinoma of the corpus uteri can almost with certainty be made, provided there is not carcinoma of the vaginal cervix. The uterus is usually enlarged and its consistency changed, and only very rarely is there pain. There are two procedures which are of great assistance in making the diagnosis: palpation of the uterine cavity with the finger after dilatation of the cervix and the microscopical examination of curetted tissue. In five of the cases he was able to make a positive diagnosis by palpation, and in seventeen the microscope showed carcinoma. Eleven of the twenty-nine cases had a comparative age of 41.3 years, and among these were two girls, one 18 and the other 22 years of age.

Primary Horny Epithelioma of the Corpus Uteri.

Flaischlen (*Centralblatt für Gynäkologie*, No. 22, 1895), at a meeting of the Obstetrical and Gynecological Society of Berlin, March 22, 1895, read a paper upon horny epithelioma of the corpus uteri, referring to the cases reported up to the present time. He classifies the disease in three categories: (1) the superficial extension of a cervical cancroid over the inner surfaces of the uterine body. (2) The metastases of squamous epithelioma from a primary cervical carcinoma. (3) The development of a primary squamous epithelioma on the endometrium of the uterine body. An instance of the first is the case reported by Benckiser, also later one case by Hofmier and one by Gebhard. The second category is represented by a case reported by Pfannenstiel. As regards the origin of both of these secondary forms all authors agree. They develop from the superficial squamous epithelium. In the development of this form of cancer the glands of the endometrium are undisturbed. In none of the cases was the squamous epithelial new growth at all similar to the disease described by Zeller as ichthyosis. Of the greatest interest is the primary development of squamous epithelial cancer in the corpus uteri. Up to the present time only three cases are to be found reported in the literature (Piering, Gebhard and Lohlein). The first two cases are described by the writer in detail. In Lohlein's case the diagnosis was made only from the microscopical examination of curetted tissue. Flaischlen describes another case of this last form. The patient was 54 years of age, and the diagnosis was primarily made through the examination of curetted tissue. The uterus was removed by vaginal hysterectomy. The patient was operated upon one year ago, and there are no signs of a return of the disease. Half of the extirpated uterus was demonstrated at the meeting. The growths occupied the greater part of the anterior surface of the corpus uteri. The uterine cavity was enlarged because of a pyometritic process. The posterior wall and cervix appeared normal. The microscopical examination showed the superficial surface of the growth covered with a thick layer of squamous epithelium with numerous processes of ingrowth dipping deep down in the tissue, distorting it. In two of the processes there was marked horny change with degeneration in the centre. The presence of pearly bodies gave the typical

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picture of horny carcinoma. In the centre of the degenerated areas there was a peculiar papillary condition. Upon the posterior surface of the uterine wall there was seen in many places horny squamous epithelium which projected into the stroma. The internal surface of the cervix showed the mucous membrane covered by squamous epithelial cells. Therefore, except on the posterior wall of the uterine body, the uterine cavity was lined with squamous epithelium, which the writer concludes was due to the transformation of cylindrical epithelium. Considering the condition found on the posterior wall, it was evident that the disease was primary in the anterior wall of the uterine body; that it was developing into characteristic carcinoma of the corpus uteri; and that it must have developed from the superficial epithelium of the glandular tissue.

Primary epithelioma of the uterine body, as a rule, appears in women who have passed the menopause.

EMANUEL (*Centralblatt für Gynäkologie*, No. 22, 1895), at the same meeting of the Obstetrical and Gynecological Society of Berlin, reports a case of horny epithelioma of the corpus uteri. His patient was a woman, 44 years of age, who came to J. Veit for treatment because of hemorrhage. A diagnosis of cervical carcinoma infiltrating the left broad ligament was made and the uterus completely removed after the method of Freund. After removing the uterus it was found that the disease extended to the mucous membrane of the corpus uteri, which was covered with small protuberances with pale crests. The microscopical examination of the uterine mucosa showed complete absence of glandular and stroma tissue, it being replaced by typical horny epthelioma which had already infiltrated the muscular wall. A similar condition was found in the cervical canal, except that here the disease was more superficial, more papillary, and did not disturb the substance of the cervix. Emanuel believes this to be a very rare case, that, as described by Gebhard, the epithelioma has its origin in the superficial epithelium, and has a tendency to send processes deep down into the tissue. This disease, he believes, began in the uterine body as a horny epithelioma. The writer concludes that the disease was secondary in the cervix from the following facts:

(1) That there may be diffuse and associated infiltration of the carcinoma in the corpus uteri.

(2) Because of the deep-seated infiltration of the uterine muscle with carcinomatous nodules.

(3) The likelihood of a secondary cervical carcinoma from a primary carcinoma of the corpus uteri.

(4) The relative greater frequency of primary squamous epithelioma of the corpus uteri as compared with primary disease of the same sort in the cervical canal.

Discussion.—Gebhard referred to the very great variery of epidermal disease of the inner surface of the uterus, and doubted very much the possibility of the disease described by Zeller. Ruge agreed with Gebhard that when stratified epithelium is found inside the uterus it is always suspicious and should be considered malignant, as in the case recently reported by Rosthorn.

VAGINAL HYSTERECTOMY FOR INFLAMMATORY AFFECTIONS OF THE UTERINE ADNEXA.

LAFOURCADE (*Archiv. Prov. de Chir.*, No. 10, 1894, and No. 1, 1895) states that this form of treatment for inflammatory disease of the tubes and ovaries was first proposed by Péan and afterwards recommended by Segond. Its advantages are

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that it is more easily performed than laparotomy, the results are better, and it has none of the disadvantages caused by the abdominal wound. There are various methods of performing this hysterectomy, depending much upon the condition found in each particular case. Method of Péan: If the uterus is not fixed and small, he employs the ordinary clamp method. Where there are adhesions, pyosalpinx, etc., the uterus is removed by morcellation,—*i.e.*, step by step, by making transverse incisions in the uterine wall after clamping with forceps. The tubes and ovaries are then separately removed. Method of Segond: After separating the cervix, dissecting back the bladder and ligating the uterine arteries, conical portions of uterine tissue are excised until the fundus is reached, when the surrounding tissue and upper portion of the broad ligaments are ligated. Method of Doyen: When Douglas's cul-de-sac has been opened and the bladder displaced the anterior wall of the uterus is incised in the centre and separated and the tissue on each side is clamped. The incising, separation, and clamping progresses from below upward until the fundus is reached. If the uterus is very large, a V-shaped portion of the anterior uterine wall is excised. The cervix is drawn progressively downward, clamps are applied to the broad ligaments, and the uterus removed. Method of Müller-Quénus: This differs from the above in that the uterus is completely divided into two halves, anterior to posterior. In all four methods, after opening the posterior vaginal vault, a thorough bimanual examination is made to determine the condition of the tubes and ovaries. If the vagina is too small, a lateral incision is made. Drainage is unnecessary except where there is pus. Drainage by partial resection of the uterus is condemned. The after-treatment is as usual. Complications, such as injury to the intestines, bladder, and ureters, are not more common than in laparotomy. Secondary hemorrhage and prolapse of the vagina between the clamps are uncommon, and if a fistula results it is easily repaired. The mortality of vaginal hysterectomy for suppurative adnexa disease is from 8.03 per cent. to 12.5 per cent. Bourdon's mortality with this method of treatment for pyosalpinx and ovarian abscess is 3.8 per cent., and in non-inflammatory diseases he has not lost a case. The final results are good. Segond, with 128 cases, reports 118 perfectly well. Indications: Hysterectomy is indicated in disease of the uterine adnexa when it is bilateral. If the diagnosis is not positive, an examination is made, as described above, after opening the posterior vaginal vault. A second examination is also made after removing the uterus, determining whether there are other pus sacs which have not been diagnosed, and if the sac is to be removed or simply drained. Where the pus sac cannot be removed, diffuse pelvic abscess, perhaps with a fistula, hysterectomy is the only method to be considered. This last is always the indication where there is a collection of pus in the true pelvis and extensive adhesions. The abscess is thus drained after the removal of the uterus, the wound healing by cicatricial contraction or granulation. The best indication for vaginal hysterectomy is, therefore, bilateral pyosalpinx. It is also applicable in nervous diseases, where not only the adnexa are affected, but also the other genital organs. Again, it is indicated in retroversion complicated with bilateral salpingo-oöphoritis.

Hysterectomy by Means of the Thermo-Cautery as a Method of Preventing the Return of Carcinoma.

Rosner (*Centralblatt für Gynäkologie*, No. 21, 1895) refers to the progress in the method of treating carcinoma of the uterine cervix, and advises the use of the thermo-cautery as the most preferable. He divides the cases of carcinoma into three classes:

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(1) Where one must contend with carcinomatous disease affecting a great part of the uterus.

(2) Where the aim of the operator is to remove also the surrounding connective tissue. And—

(3) Those cases in which we (thanks to Winter) seek a radical cure by preventing auto-inoculation.

In the first instance the removal of the disease was primarily sought through high amputation of the cervix. This was soon followed by the abdominal method of Freund. Then the vagino-abdominal method of Rydygier was the more advised. Finally, during recent years, vaginal hysterectomy has alone been employed. The conclusions from this last method are, that it has been performed with extraordinary results regarding mortality, but, finally, no more has been accomplished than by former operations. A large number of the cases are operated upon late, the cases in which the new growth has extended beyond the borders of the uterus and have progressed so far that a cure is not looked for. Again there are indefinite cases where the growth appears local and the disease rapidly returns. By the so-called sacral method, that of Mackenrodt, Schuchard sought to remedy this latter evil, defying the disease uncomfortably near the peri-uterine tissue, ureters, and the possible or positive presence of carcinomatous nodules. How much these methods are worth in comparison with the more simple operation cannot, from statistics at the present time, be correctly estimated, but it is safe to say that the results are no better, particularly in preventing auto-inoculation. Winter says we must seek a better method. A study of the literature of recent years proves that already one has been found in the prevention of auto-infection. We are forced to believe that carcinoma is auto-inoculable, for it has been proved experimentally by Wher, Hanau, and Moran on animals, and by Hahn and Cornil on man. Clinically it has been proved by the case reported by Winter, where the disease returned four months after operation in the site of an episiotomy, the episiotomy being necessary to facilitate the removal of a primary cancer of the anterior vaginal wall. Auto-inoculation of cancer being known as a positive cause of the return of carcinoma, the writer asks how this can best be prevented during vaginal hysterectomy. With this object in view, Plicque, Winter, and Mackenrodt have advised cauterizing the surface of the growth before operation, and the removal of carcinomatous particles during operation with instruments, the fingers or continuous irrigation with sublimate or carbolic acid solutions. This, however, is difficult in the operation and irrigation with these fluids, impossible after the peritoneal cavity is opened. Thus it seems desirable that there should be no bleeding wound,—in other words, the thermo-cautery should take the place of the knife and scissors. The use of the thermo-cautery in this sense has been referred to by Olshausen and Schröder, but Jordan was the first, March 30 of this year, to do the operation. The method has been applied in three cases by Jordan, once by Sweitalski, and once by the writer. The operation is performed in the usual manner, except that forceps are used to clamp the tissue before applying the cautery, and that high amputation of the cervix is performed with the cautery as a precaution after opening the peritoneal cavity and applying the first two forceps. The knife is used only to separate the bladder from the anterior uterine wall.

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THE TREATMENT OF INOPERABLE UTERINE CARCINOMA WITH ALCOHOL INJECTIONS.

VULLIET (*Revue méd de la Suisse, Rom.*, No. 1, 1895) advises, as a new method of treating inoperable carcinoma of the uterus and carcinoma returning after complete hysterectomy, the hypodermic injection of alcohol. Nine to twelve injections, depending upon the degree of pain, are made at each sitting with a Pravaz syringe. The needle is introduced deeply into the tissue and three or four drops are expelled. The area of injection begins in the centre and goes towards the periphery, the new growth or ulcer being, lastly, in the healthy tissue, surrounded by a ring of injections. The duration of the interval between injections is dependent upon the tolerance of the patient. Alcohol causes the tissue to become dry and hard, the growth is cirrhosed, the circulation poor, and thus the growth is limited. The result is, of course, palliative, but the treatment at least prevents the hemorrhage and bad-smelling discharge.

MISCELLANEOUS.

THE WILLIAM F. JENKS MEMORIAL PRIZE AWARDED.

THE William F. Jenks memorial prize of $500, under the deed of trust of Mrs. William F. Jenks, has been awarded to A. Brothers, M.D., 162 Madison Street, New York, for the best essay on "Infant Mortality During Labor, and Its Prevention."

The Prize Committee also reports as highly meritorious the essay on the same subject bearing the motto, "Vade Mecum."

The writers of the unsuccessful essays can have them returned to any address they may name, by sending it and the motto which distinguished the essay to the Chairman of the Prize Committee, Horace Y. Evans, M.D., College of Physicians, Philadelphia.

JAMES V. INGHAM,
CHARLES S. WURTS,
I. MINIS HAYS,
Trustees of the William F. Jenks Memorial Fund.

INTERNATIONAL CONFERENCE ON THE SANITARY SERVICE OF RAILROADS AND NAVIGATION.

AN International Conference on the Sanitary Service of Railroads and Navigation will be held in Amsterdam, Holland, on Friday and Saturday, September 20 and 21, 1895. It is hoped that, by com-

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parison of the customs of different countries and the discussions that will be brought out, uniform regulations may be adopted. An invitation is extended to the different governments and transportation companies to send delegates to the conference. Papers on matters pertaining to this subject are solicited. The delegates of each country are requested to organize before the meeting in order to be able to present as complete a report as possible of the measures now in force in the respective governments and companies.

Those expecting to send delegates are requested to communicate with the secretary, General M. le Docteur Pijnappel, Stadhouderskade 60, Amsterdam, Holland, the names and capacities of each before September 1. The price of membership has been fixed at 5 florins, which will include a copy of the transactions. Members' tickets will also admit the bearers to the Zoological Gardens and the International Exposition.

BOOK NOTICES.

A SYSTEM OF SURGERY. By American authors. Edited by FREDERICK S. DENNIS, M.D., Professor of the Principles and Practice of Surgery, Bellevue Hospital Medical College, New York; assisted by JOHN S. BILLINGS, M.D., LL.D., D.C.L., Deputy Surgeon-General U. S. A. In four imperial 8vo volumes, containing about 900 pages each. Philadelphia: Lea Brothers & Company, 1895.

The multiplication of medical works was never so active as it is to-day. Books that hope to endure for any period must be subjected to frequent revisions, or they will be supplanted by more modern productions. The ceaseless investigating activity which characterizes medicine results in many changes in its teachings within a few years.

This system of surgery is written entirely by American authors. The enviable position which American surgery holds, leads us to hope that the work before us will reflect this high standard, and the names of the contributors to the first volume encourage the belief that this hope will be realized.

The subject is introduced by a very interesting chapter on "The History and Literature of Surgery," by Dr. John S. Billings. The sketch covers a period of about 3000 years, and gives a brief account, mainly in chronological order, of the chief discoverers, improvers, and inventors in the art, as well as the principal teachers of it. Mention is frequently made of the prevailing methods of treatment of different times, and of the relations of the surgeons to education and legislation.

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The history is necessarily condensed on account of the limited space at the command of the author.

"Surgical Pathology and the Repair of Wounds" is contributed by Dr. W. T. Councilman, Professor of Pathology in the Harvard Medical School. The subject of inflammation is exhaustively treated according to the most recent pathological views on the subject. The relation between bacteria and inflammation, the importance of which has been but recently appreciated, is fully discussed. The chapter includes also ulceration, repair and regeneration, fever, thrombosis and embolism, hypertrophy and regeneration, death, neurosis, atrophy, degeneration and tuberculosis, and tubercle.

"General Bacteriology of Surgical Affections" is contributed by Dr. William H. Welch, Professor of Pathology in the Johns Hopkins University. The association of bacteriology in a surgical work is of very recent date, and yet, to-day, no treatise on surgery would be considered complete without a chapter on this subject. No one is better prepared to write upon this subject than Professor Welch. The colored plates illustrating the appearance of the various bacteria are excellently executed. The unnecessarily frequent use of the drainage-tube is justly criticised.

The chapter on "Symptoms, Diagnosis, and Treatment of Inflammation, Abscess, Ulcer, and Gangrene" is from the pen of Dr. Charles B. Nancrede, Professor of Surgery and of Clinical Surgery in the University of Michigan. The subjects named are treated in accordance with the modern views on these subjects, as are also numerous allied conditions.

Dr. William H. Carmalt has given a very good description of "Septicemia, Pyemia, and Poisoned Wounds."

The chapter on "Traumatic Fever, Erysipelas, and Tetanus," by Dr. J. Collins Warren, Professor of Surgery in the Harvard Medical School, contains the most recent views on these subjects.

"Rabies and Hydrophobia" is described by Dr. Hermann M. Biggs, Professor of Therapeutics and Clinical Medicine in the Bellevue Hospital Medical College, New York. Stress is laid upon the importance of thoroughly disinfecting every wound inflicted by an animal supposed to be rabid. The treatment of the disease itself is said to be purely symptomatic. Great care should be taken not to associate the condition with the bite in the patient's presence, nor to indicate the nature of the trouble.

Dr. P. S. Conner, Professor of Surgery and of Clinical Surgery in the Medical College of Ohio, has given an excellent account of "Gunshot Wounds," based upon the modern weapons and upon the improved treatment of wounds.

The subjects of "Fractures and Dislocations" have been very thoroughly discussed by Dr. Frederic S. Dennis, Professor of the Principles and Practice of Surgery in the Bellevue Hospital Medical College. The present treatment of compound fractures marks one of the most important advances in modern surgery. Whereas, within the memory of many surgeons now living, amputation was almost universally recommended in these cases, this procedure is now but very rarely employed. The reader will be struck with the great frequency with

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which the permanent dressing is recommended in fractures. The author has presented the advantages of this method of treatment, and it is coming more and more into use. It would seem, however, that the plaster-of-Paris dressing has scarcely justified the confidence which Dr. Dennis evidently has in this method of treatment. It is probable that his advice could be followed by the experienced hospital surgeon with advantage, in many cases, but those less skilled in the application of the plaster bandage will do well to follow the older plan of applying an appropriate splint. The author admits having seen gangrene occur on several occasions in the hands of "well-known surgeons" even, but he attributes this to the improper or careless use of the plaster dressing.

Dr. H. C. Wood, Professor of Materia Medica, Pharmacy, and General Therapeutics in the University of Pennsylvania, contributes a chapter on "Anesthesia." This subject has assumed renewed importance on account of the recent controversy upon the relative merits of ether and chloroform. The study which Dr. Wood has devoted to this subject enables him to speak authoritatively. The discussion that has been going on points, Dr. Wood says, indisputably to one fact, "that ether is a stimulant and chloroform a depressant to the circulation. From the evidence existing to-day, and this is by no means limited, the author concludes "that chloroform is a direct depressant and paralyzant to the heart-muscle or its contained ganglia." Although now an old subject, the surgeon will be well repaid for reading this latest exposition.

Dr. Arpad G. Gerster, Professor of Surgery in the New York Polyclinic, has described the "Technique of Antiseptic and Aseptic Surgery" in a brief but satisfactory manner.

An excellent chapter on "Operative Surgery," by Dr. Stephen Smith, emeritus Professor of Clinical Surgery, University of the City of New York, concludes the volume.

As a whole, the volume is thorough, modern, authoritative. The instances in which exception might be taken to the views expressed are isolated and unimportant. If this standard is maintained in the succeeding three volumes, American surgery will not suffer in reputation by the appearance of this work.

A PRACTICAL MANUAL OF MENTAL MEDICINE. By DR. E. RÉGIS. With a preface by M. BENJAMIN BALL. Authorized translation by H. M. BANNISTER, A.M., M.D. Press of American Journal of Insanity: Utica, New York, 1894.

This book is the second edition, "revised and largely rewritten," of a work to which in 1886 was awarded the Château Villard Prize by the Faculty of Medicine of Paris. In its present form it constitutes one of the most valuable works upon insanity of which we have knowledge. Combining, as it does, an interesting historical account of the evolution of the study and methods of treatment of mental alienation from the most ancient (previous to Hippocrates) to modern times, a thoroughly clear and scientific account of the etiology, pathology, as far as known, and symptomatology of insanity, and last, but

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not least, much valuable practical information in reference to diagnosis, prognosis, and treatment. By his admirable translation, Dr. Bannister has made a most valuable addition to the English literature of insanity.

We were specially impressed by the following,—*i.e.*, The condition which we are in the habit of terming acute delirium the author terms hyperacute mania, and would lead the reader to suppose that it was a very severe form of acute mania, but, although thinking it due to an "auto-intoxication," he does not give the same causation to acute mania.

The simple melancholia of English writers is termed acute melancholia, while acute dementia and stuporous melancholia are described together under the term hyperacute melancholia, a classification which, while simple, is not altogether to be commended. Paranoia is termed progressive systematized insanity, and the description of that disease is one of the best which we have ever seen.

A very interesting chapter is the one devoted to eccentrics, or disharmonies, as the writer terms them, and the various fixed ideas and morbid impulses and their relation to neurasthenia. These are subjects which have not been more than touched upon by previous writers.

Insanity following grippe is given attention, and while the author does not evidently believe in Professor Wood's classification of the insanities following acute diseases and other exhausting conditions in one great class, he unconsciously supports him when he says that "insanity in influenza behaves exactly like that of typhoid fever." The chapter upon general paralysis of the insane is a most valuable one. The author is, we believe with reason, a follower of Baillarger and discusses the subject under the heads of I. Paralytic dementia, the principal disease. II. Paralytic insanity, the accessory affliction. This chapter is very suggestive and will repay reading.

The methods of examining patients, deciding as to the advisability of sequestration, chances of heredity, criminal responsibility, etc., are all thoroughly discussed, and much valuable advice given.

Not the least interesting feature of the book is the fact that it is printed and bound by the insane,—*i.e.*, by the patients at the Utica Asylum, and the typography certainly does them credit.

THE TREATMENT OF WOUNDS, ULCERS, AND ABSCESSES. By W. WATSON CHEYNE, M.B. (Ed.), F.R.S., F.R.C.S., Professor of Surgery in King's College, etc., London. Philadelphia: Lea Brothers & Co, 1895.

The subjects included in the title of this book are so frequently met with that their separate consideration does not seem inappropriate. The work is thoroughly practical and is based on the author's enormous experience. He says, "I have limited myself to describing the methods which I always employ, which I know to be efficient, and which I believe to be the simplest consistent with certainty of results."

A statement of this kind, coming from such an eminent surgeon as

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Dr. Cheyne, is at once a guarantee of the value of the work. The subjects are discussed entirely from the modern stand-point. On account of the possibility of a flaw in technique in the treatment of wounds, and of the difficulty in rendering the skin sterile, the author recommends antisepsis as being safer as a rule than asepsis.

With the general treatment recommended, we are in entire accord. The statement, "it is now an axiom in surgery, that, if one has to do with a penetrating wound of the abdomen, the wound must be enlarged and the condition of the viscera thoroughly explored," is intended to apply to surgeons who employ careful antisepsis or asepsis only. The double cyanide of zinc and mercury dressing, introduced by Sir Joseph Lister a few years ago, is now always employed by the author.

A MANUAL OF THE MODERN THEORY AND TECHNIQUE OF SURGICAL ASEPSIS. By CARL BECK, M.D., Surgeon to St. Mark's Hospital, etc, New York. Philadelphia: W. B. Saunders, 1895.

This manual is based upon the author's teaching at the New York Post-Graduate School and at St. Mark's Hospital. The work is really what it was intended to be, a practical treatise on the subject. Particular attention has been devoted to descriptions of the technique of disinfection and suturing, the dressings to be employed for the different regions of the body, the maintenance of asepsis in private practice, etc. The author draws a wide distinction between wounds made aseptically by the surgeon and those otherwise inflicted, or such as are dependent upon inflammatory processes.

Iodoform is spoken of as "the ideal antiseptic drug." Its value in surgery depends upon its property of rendering the products of bacteria (ptomaines, toxines) harmless, as has been shown by De Ruyter and Behring.

This forms an excellent companion to the surgical text-books, which naturally cannot go into the details of the theory and technique of asepsis to the same extent as a special work upon the subject.

A BOOK OF DETACHABLE DIET LISTS. Compiled by JEROME B. THOMAS, A.B., M.D., Visiting Physician to the Home for Friendless Women and Children, etc., New York. Philadelphia: W. B. Saunders, 1895.

This book contains detachable diet lists for albuminuria, anemia and debility, constipation, diabetes, diarrhea, dyspepsia, fevers, gout, or uric acid diathesis, obesity, and tuberculosis. A sick-room dietary, also detachable, is included.

These lists appear to have been selected with great care, and will be found very useful in carrying out the dietetic treatment of the diseases mentioned,—by no means the least important part of the physician's duty.

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The dietary sheets contain the directions for preparing a large number of foods for the sick in constant use, but which only those with experience know how to prepare. With this book, the proper leaf torn out and handed to the patient or care-taker relieves the physician of writing detailed directions or of making extended explanations which would be apt to be forgotten.

SYLLABUS OF GYNECOLOGY. By J. W. LONG, M.D., Professor of Gynecology and Pediatrics in the Medical College of Virginia, etc. Philadelphia: W. B. Saunders, 1895.

This syllabus, the author states, has been written with a threefold object: to be used as lecture notes, to enable the student more intelligently to follow and remember the lectures, and as a convenient reference for practitioners. It is based on the *American Text-Book of Gynecology*, and certainly fulfils well the objects intended by the author, as indicated above. It is of a size that may be conveniently carried in the pocket, and is interleaved for additional notes.

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